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the magazine of the Royal Ontario Museum

T. REX, *Exposed?*

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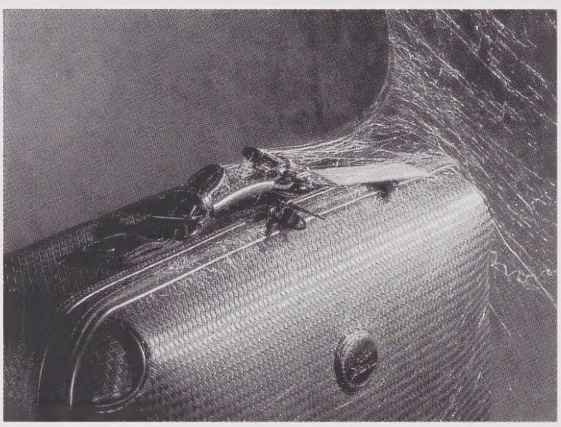

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The joys of contemplating dinosaurs and other things

All of us on staff have been catching up on our dinosaur facts as the ROM prepares for DINOSAURS, beginning 20 October. Over the years each new piece of dinosaur evidence has raised as many questions as answers and that is one of the reasons that dinosaurs have continued to be compelling subjects.

Dinosaurs also have monster appeal. But rather than capitalizing on this attraction the best palaeoartists, from Charles Knight to those of the present day, have worked with palaeontologists (or are palaeontologists themselves) to produce the most accurate recreations of prehistoric life. The popularity of their work proves that Truth is stranger than Godzilla. However, in our cover story, science writer Don Lessem has used *Tyrannosaurus rex* to show that gaps in knowledge still make it impossible to get everything right. In fact, he shows that even the most informed artists may have depicted the beast all wrong.

Turning from dinosaurian controversies to museological ones, the debate is on over the feasibility of London's new Museum of the Moving Image, scheduled to open in mid September. The museum's objective is the exhibition of 5000 years of moving images, from Chinese shadow plays to fibre optics. Even before the first member of the public has walked through the doors, critics are asking if the definition of museum is being stretched beyond any real meaning. Noah Richler, a producer with BBC Radio in London, looks at all sides of this issue. At a time when traditional museums everywhere are re-examining their display techniques and collection policies, MOMI should be an interesting case to study.

Museums may serve as repositories of cultural artifacts, but only through practice can a culture be kept alive. Jim McDonald, from the ROM's Department of Ethnology, was invited to the Kitsumkalum Valley of British Columbia last summer to witness a special event: the raising of two totem poles. These were the first poles to be raised in this region for more than 150 years, and, for the Tsimshian people, it signalled a new beginning. In his article McDonald describes the commitment of these people to the revitalization of their culture. They are researching the past and finding ways to make their culture relevant in modern western society. Furthermore this renewed pride in their Tsimshian heritage is giving these people the confidence and the desire to take a more active and positive role in the province.

Our last feature story covers a delightful bit of research. Recently the Museum received a gift of an exquisite 19th-century French shawl. Brigitta Schmedding of the Textile Department sent a photograph of the shawl to Monique Lévi-Strauss, a Parisian expert on shawls, hoping that she would be able to identify the garment and uncover some of its history. In her article Lévi-Strauss explains how she and colleagues in the Louvre and Bibliothèque nationale pieced together the story from an old photograph, engravings, and the court transcripts of a series of counterfeit cases. This tale will appeal to scholars and mystery buffs.

There is just one more thing to say about dinosaurs before I sign off. I often find myself working in the Museum at various hours of the day and night, and sometimes I visit the dinosaur gallery during breaks. Our dinosaurs are definitely most thrilling at night when only the security lights are on in the gallery, because if you stare in the right direction for a while, the dinosaurs loom out of the dark. Of course it is necessary to get security clearance before playing this game, a recreation which I consider to be one of the perquisites of my job. Another was gathering the articles covering the very ancient past to new cultural horizons. I hope that you enjoy reading this issue of *Rotunda*. S.S.

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COVER
This is what many of us could imagine we are seeing after spending too much time in the sun, and what Stephen and Sylvia Czerkas's neighbours really do see. For a *Tyrannosaurus rex* palaeo-art update, turn to page 34. Photo courtesy of Sylvia Czerkas.

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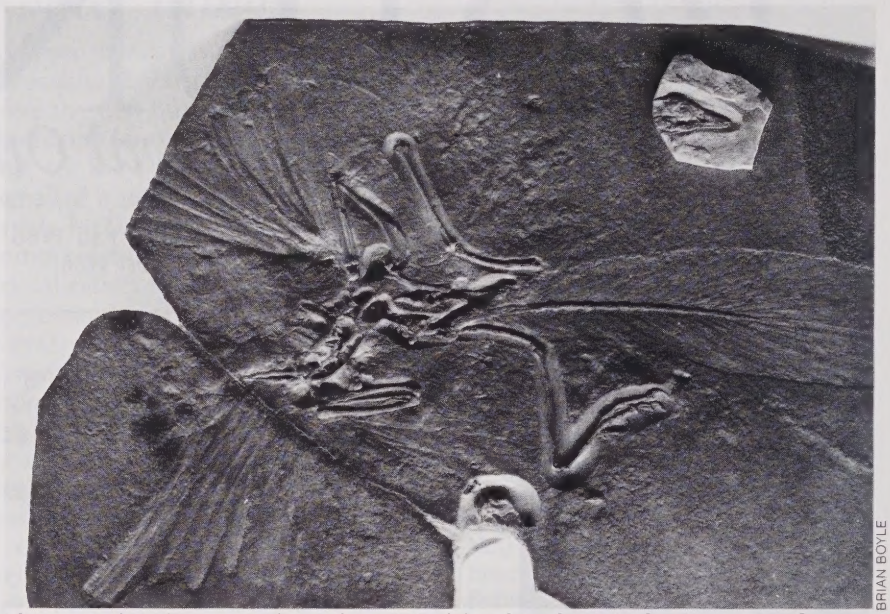
Dinosaurs, Saturdays, and the ROM



BRIAN BOYLE

This cast of *Archaeopteryx* from the original fossil in the British Museum is the centrepiece in the ROM's Gallery of Evolution.

Dinosaurs are still the rage at the ROM, and rightly so; they are fascinating creatures. I always feel a little nostalgic when it comes to dinosaurs for they are partly responsible for my entry into the museum business. Shortly after I first became interested in archaeology, I was introduced to vertebrate palaeontology as a member of the Saturday Morning Club. In 1948, after my group had spent almost every Saturday for a year in the Department of Vertebrate Palaeontology playing with and learning about fossils, the Museum invited us to give speeches about the year's activities before doting parents, aunts, uncles, and friends. The ROM Theatre is where I gave my first public talk. It was entitled *"Archaeopteryx*, the Flying Reptile."

Archaeopteryx was a theropod (beast-footed) dinosaur, a two-legged flesh-eater. The fossil remains of *Archaeopteryx*, possibly the ancient predecessor to birds, are found in the fine-grained limestones of the Late Jurassic period in Germany (190 000 000 to 136 000 000 years ago). All known specimens come from the Solenhofen Limestone Formation, which probably represents the fossilized remnants of a tropical marine environment, possibly a coral lagoon. Here, lime-rich muds accumulated very slowly, and this allowed the specimens to be remarkably well preserved.

Archaeopteryx was probably a reptile. About the size of a crow, it had a lot of features in common with the smaller, bipedal dinosaurs. Its reptilian features included a long tail, rather like that of many modern lizards, and teeth. It was very like a bird, however, in that it had a full set of feathers and a proper wishbone. The thermal qualities of the feathers have led some scientists to suggest that the creature may have been warm-blooded. While its three-clawed hind feet were somewhat birdlike, it did not have the fused ankle bones of true birds. Its forelimbs had evolved somewhat like birds' forelimbs, but they were not full-fledged wings. Nevertheless, they did make some kind of flight possible. *Archaeopteryx* could glide well on strong currents of air and could possibly fly a little under its own power. But its keel or breastbone (sternum) was not at all birdlike. The development of a strong keel is an important feature of birds for the keel supports the large muscles that provide the

power for true flight.

There were, of course, a good many unfeathered reptiles in the Age of Dinosaurs that really flew. But only my old friend *Archaeopteryx* had feathers and a developed wishbone. So, even though it may not have flown as well as some contemporaries, it represents a major junction point in the evolution of flying animals. Just how it fits into the story of bird evolution—whether its place is in the main line of avian evolution or possibly as a dead-end try early in the process—is not clear. But modern science's conclusion that birds almost certainly evolved from dinosaurs is based, to a great extent, on *Archaeopteryx.*

All of this information on *Archaeopteryx* was very heady stuff for an eighth-grader and great material for my first public lecture. Mom and Dad loved it. I loved the slides that accompanied my talk. Some of our vertebrate fossils are, in my judgement, among the most beautiful things in the Museum's collections. I came to that conclusion while in the Saturday Morning Club, where I was given a chance to learn about many of those fossils on a first-name basis. The ROM's cast of *Archaeopteryx,* from the original specimen in the British Museum, was such a fossil. It was a thrill to handle, to learn about, and to look at. Now it is the centrepiece in the Museum's Gallery of Evolution.

The slides I used in my lecture took the prize for the evening, and I don't think that what I said mattered at all. Ever since I have been nervous when I give a public talk without slides.

In the end, vertebrate palaeontology did not hold me, and I returned to my first interest, archaeology. For me, people turned out to be the most fascinating of the vertebrates. People and their cultures and how they come and go—and evolve—just like flying reptiles and dinosaurs.

Actually, I could just as well have studied archaeology in the Saturday Morning Club—just as kids can

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today. A couple of years ago, while I was associated with the West Asian Department, there was a small group of kids, about the same age that I was in 1948, that regularly visited the department in order to handle pot sherds, look at drawings, examine stone tools, and stare at ancient bronzes. I suppose that at the same time there was another similar group in the Department of Vertebrate Palaeontology.

Most of the ROM's public experiences the collections and what we know of them through galleries and special exhibitions.The Museum is, however, constantly trying to find ways for people of all ages to have a better understanding of what we have to offer through closer contact with the collections. The Discovery Gallery is a good example. There, in a semi-public setting, visitors can enjoy learning about and handling material from the collections. About fifty-five per cent of Discovery Gallery visitors are adults. Behind-the-scenes programs are another way for our public to gain a better understanding of the ROM.

Special Interest Groups are new and are designed for ROM members who have expressed a particular interest in a certain segment of the collections. They provide an opportunity for a more in-depth association with the artifacts or specimens and with the curators. There are currently five groups: Anthropology, The Wonder of Shells, 20th Century Design, Islamic Art, and Library-Archives. Many members of these Special Interest Groups are collectors, and through the group contacts the ROM can often provide them with the information and knowledge that they need in order to collect well and to enjoy better what they have.

Other members who do not collect but who still have a keen interest in a particular area of the collection can benefit from the involvement in the Museum that membership in such a group provides. Special Interest Groups are like an adult version of the Saturday Morning Club of my youth, where a limited number of participants

could explore a specific area of the collections. Maybe we will eventually have a Special Interest Group in vertebrate palaeontology in which the participants will be able to find out still more about *Archaeopteryx*.

Museum scientists have accumulated a great deal of research on my feathered friend and its cousins since 1948. Dr. Chris McGowan of the Department of Vertebrate Palaeontology and Dr. Allan Baker of the Department of Ornithology have conducted research in the last decade on the evolutionary origins of birds—both those that do and those that do not fly. The cover story in *Nature*, volume 307, number 5953 (23-29 February 1984) explains their work. A colour photograph of a brightly stained quail embryo and the assertive statement, "Ostriches primitive, not degenerate," adorn the cover. McGowan's article is called "Evolutionary relationships of ratites and carinates: evidence from ontogeny of the tarsus." The article, in detail, is virtually incomprehensible to those outside the field, but what is clear is that the evolution of birds, the place of *Archaeopteryx* in this evolution, and the relationship of birds, reptiles, and dinosaurs are complicated with many interesting side roads that must be explored before we will truly understand it all.

And that is the story of the ROM. First there are collections, then there are years of steady, careful research shared with other scientists. From this process come public galleries through which the collections and our research are shared with the widest audience possible. And finally, from that wide audience come members whose interest in some area has been stimulated and who want to know more. That is why we provide facilities and programs such as the Discovery Gallery, the Special Interest Groups, and the Saturday Morning Club. They all make the ROM a great research institution that is available to people of all ages and levels of interest and involvement. The ROM is an educational institution in the fullest sense.

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One of the Christian burials found at Tipu.

Burials, as the irony would have it, tell archaeologists an almost infinite variety of things about life and the living. On the one hand, studies of the human skeleton can tell a great deal about relative proportions of protein in the diet and, combined with statistical studies of sex ratios and height variations, about whether some people were living better than others and about status differences among individuals in a society. However, the burial itself, when it is excavated, is perhaps the most revealing statement of all.

When archaeologists carefully brush the earth from a human skeleton, they begin to see into the past to which that person belonged.Their interest stems above all from a deep respect for the individual's investment in his or her way of life, and the archaeologist's motivation is to find out about that way of life and what can be learned from it.

Throughout the ages most people have believed that at the time of death a person enters a state of transition, which is sometimes described as the road to the afterlife. The number of ways in which people can be laid to rest reflects a variety of beliefs about the soul in transition and about the nature of the afterlife.

At the site of Tipu in Belize, where I have been excavating since 1984, research has focused on a 16th-century cemetery associated with an early Christian church. The cemetery is not marked, and in fact includes the inside of the nave of the church as well as an area bounding the church on the north, west, and south. In the process of burying people in this cemetery, the Maya disturbed a number of pre-Conquest (before 1540) internments. As a result we have been able to compare the ways in which individuals were buried from the end of the Classic period (A.D. 750–850), when the "traditional" form of Maya civilization is believed to have collapsed, through to the late 17th century.

In all of the Christian burials, the body was laid out on the back with the head pointed to the west. Either the arms were folded over the chest,

A bound burial from Lamanai.

A seated burial from Tipu. With the passing of time, the skull has fallen down between the legs.

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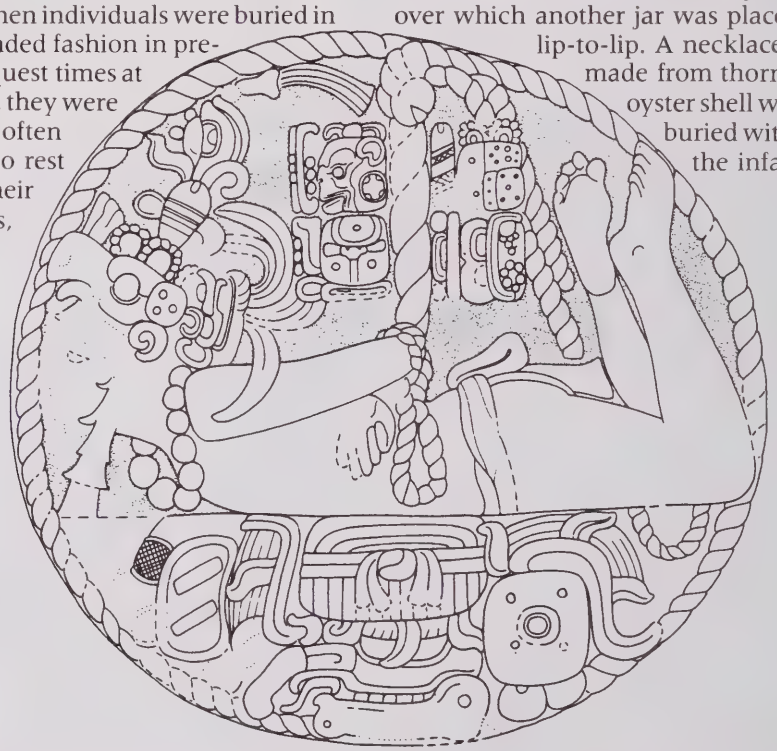
or the hands met lower down over the pelvis. There are no grave offerings because it is Christian belief that the individual's soul enters the afterlife leaving material goods behind. The jewellery and clothing accessories (buttons, pins) buried with the deceased are often the only clues we have to the individual's status and general beliefs about what was of value.

In contrast, pre-Conquest Maya graves very often contained a number of vessels, presumably to hold food and/or other perishable goods. The difference from Christian belief and practice is even more striking when one considers that the Maya must have believed that the vessels and contents had souls of a sort. Once ritually killed (often by piercing the bases) and placed with the dead, the pots and their contents were believed to have the potential to transcend the material world in some form and serve the individual in the afterlife, or at least in the transition from this world to the next.

When individuals were buried in extended fashion in pre-Conquest times at Tipu, they were most often laid to rest on their backs, but variations on this theme were common, such as placement of the body on its stomach with the head face-down in a shallow bowl. Three such burials were among eight that were found in a building that was constructed some time in the 8th or early 9th century, and the individuals were buried in oblong pits cut through floors of various phases of the structure. In most cases burials were sealed by the laying down of a new floor.

Though extended burials seem to have been the standard practice in Late-Classic times at Tipu, the practice changed in the Post-Classic period (about A.D. 1100–1500); not one extended burial was found dating from this period. Between about 1100 and 1500, individuals were buried, with or without grave goods, in roughly circular pits, where they were either seated with their knees brought up to their chins, or they were flexed, also with knees drawn up, but resting on one side. There was even a case in which an infant was buried inside a jar, over which another jar was placed lip-to-lip. A necklace made from thorny oyster shell was buried with the infant.



A bound figure inscribed on a Classic-period monument may offer some explanation of the unusual bound burials at Lamanai. Courtesy of The University Museum of Archaeology/Anthropology, University of Pennsylvania. Reproduced from *Tikal Report 33: The Monuments and Inscriptions at Tikal: The Carved Monuments*, Part A. Drawing by William R. Coe.

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— *ILLUMINATIONS* —

Although it is not found at Tipu, there is another burial position of Post-Classic times worth mentioning. This is the bound burial, apparently known only at Lamanai, in which the individual was placed face down with the arms bent tightly so that the hands were at the chin, and the legs were tightly flexed back with the feet on the buttocks.

There is no end to the questions that can be asked about the different kinds of burials. At Lamanai people were sometimes buried side by side in markedly different positions. Among the Maya it was not unusual for infants and children to be treated differently from adults, and the burials that we found beneath Late-Classic-period house floors were often those of juveniles. All we can say is that burials were related to what the Maya thought was appropriate for the individual's entry into the afterlife. In modern times, people are commonly buried on their backs in a way that imitates a common position that adults take when sleeping. The ancient Maya practice of burying people on their stomachs may relate to the direction in which people were to journey after death: beneath the earth to the underworld, a region closely connected in the Maya consciousness with caves.

Speculation about the seated, flexed, and bound burials is more difficult. The flexed burials may have been an attempt to mimic the fetal position. The seated burials may have simply duplicated the squatting pose that people often adopted in a society in which chairs were not used. Several bound captives on Classic-period monuments appear to have their legs drawn up behind them, and it is possible that the bound burials were those of captives taken in war, or at least that they represent people buried in a way that may relate to the iconography of Classic monuments. What we do know is that the final positions and places of rest are as varied as the beliefs that fostered them.

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A bitter tale

Popular bitter-tasting foods include leaves of endive and dandelion, beer, coffee, and chocolate.

Think of a glass of cool beer on a hot afternoon, a sprightly salad of endive and dandelion, a wafer of dark chocolate to complement a demi-tasse of black coffee. Now, what do they have in common?

Full marks if you said bitterness. All are bitter to a greater or lesser degree, and the fact that most of us relish at least some of these foods and drinks says much for the human animal's ability to learn, even if such learning means going against natural inclinations.

Of the four main taste sensations—sweet, sour, salt, and bitter—only bitter is innately disliked by human infants. Sweetness is innately enjoyed, and experience with varying flavours brings appreciation of sour and salt fairly quickly. It's acquiring a taste for bitterness that takes time.

That's probably a good thing in a world where many plants that contain poisonous alkaloids are marked by a bitter flavour. Children have more taste buds than adults do—our supply gradually decreases, especially after the mid-forties—and this may provide additional protection for tots too young to have discovered which roots, nuts, leaves, and berries to avoid if they want to survive.

The truly odd thing is that we humans came to appreciate bitterness at all. I've found no reference source bold enough to state a definite reason, but there are a few clues scattered in the literature. For one thing, our forebears began discovering that certain bitter foodstuffs (if not taken to excess) promoted health. Then again, some of the earliest spring plants, defying chill temperatures and even late snow, thrust out young leaves when our northern ancestors would have been longing for freshness after a winter-long diet of rancid meat and withered tubers. Dandelions, chicories, and wild lettuces must have been welcome enough to overcome any residual reluctance.

Originally, bitter meant something biting, cutting, or sharp, but now the Oxford Dictionary defines it as "having the characteristic taste of wormwood, gentian, quinine, bitter aloes, soot." *Soot?* I can't imagine that many of us will want to scrape the chimney to prove or disprove this allegation, but the other substances—undeniably bitter all—have played interesting and sometimes dramatic roles in our medicinal and gustatory history.

The anaesthetic and antibacterial qualities of the juice of *Aloe vera* and several of its relatives have been valued for centuries in the treatment

of burns, abrasions, even the rash caused by poison ivy. (Look closely at certain popular sunburn remedies; you'll still find its name among the active ingredients.) Less happily, the acridly bitter juice has been rubbed on children's fingers to discourage nail-biting and thumb-sucking. Native to semi-arid regions of Africa, aloes are widely cultivated in other parts of the world as well, and live happily as houseplants on many window sills, ready to sacrifice a fleshy leaf when the cook scorches a hand or a child scrapes a knee. Even the wood of the larger species has been deemed beneficial—for driving off evil spirits—so it is burnt as incense in many temples in India and China.

Aloes very rarely find their way into anything resembling human food—the only examples I know are the infinitesimal amounts found in some *fernets* and bitters—and indeed some species can be toxic if taken internally. The cinchona tree, whose bark yields the valuable substance quinine, has more widespread uses. Indigenous to the Andean regions of Bolivia and Peru, it was known to local Indian tribes as *quinaquina*, the "bark of bark," because of its efficacy in coping with otherwise deadly fevers. Then, in 1820, the alkaloid was isolated by Europeans. Predictably, demand for this potent plant cure has nearly wiped out the trees because stripping the bark eventually kills them.

After the Second World War, with DDT considered a miracle that would rid the world of malaria mosquitoes forever, and with synthetic drugs to deal with the malaria that still existed, the possible loss of cinchona and its bark may have seemed inconsequential. Then the DDT "miracle" turned into an environmental nightmare, and by 1984 the malaria parasite was proving resistant to synthetics. Quinine—now also harvested in other parts of the world—is once again the most effective remedy.

Cinchona's gustatory contributions include various bitters, such as Amer Picon, and tonic water, today's ubiquitous mixer that was intended as a fever preventative in tropical locations. Recently, Finnish researchers have been testing a bitter substance obtained from the humble dandelion to see if it can provide a cheaper substitute for quinine.

The intensely bitter roots of yellow gentian *(Gentiana lutea)* also flavour a number of the semi-medicinal mixtures that, alone or in soda's company, provide a host of bracing drinks. Distant descendants of the brews concocted in medieval stillrooms, bitters in general stimulate the appetite, while gentian in particular has long been considered effective against liver complaints and a neutralizer of poisons (an explanation, perhaps, for its popularity as both a *digestif* and a hangover remedy).

Wormwood *(Artemesia absinthium)* is perhaps the most villainous bitter. Its common name came from the herb's use, for thousands of

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years, to rid people of intestinal worms. But as its botanical name suggests, it has also appeared in various *aperitifs* and herb wines, most dangerously in absinthe. The original formula, developed around 1790, included narcotics derived from wormwood leaves. These, combined with the liqueur's high alcoholic strength, induced a curious state of intoxication that sometimes approached delirium. By the end of the 19th century, there was a campaign to ban the drink as a health hazard, and this object was finally accomplished around 1915 in most of Europe as well as North America, although versions of the drink can still sometimes be found elsewhere.

Although vermouth's name is derived from *Wermut* or *wermod*, the German and Anglo-Saxon words for wormwood, it has a considerably more benign history than absinthe. Based on either red or white wines, vermouth is flavoured with a multitude of aromatic, sweet, and bitter spices and herbs. Each manufacturer jealously guards his own recipe, which may include quinine, juniper, coriander, or orange peel as well as the notorious wormwood, although never in quantities great enough to cause problems for the modern martini drinker.

Many other substances contribute to our repertoire of bitter. Hops put the bite in beer. Bitter almonds, although they contain deadly prussic acid, can flavour pastries and candy. Cos lettuce, favoured by the ancient Egyptians, turns up as romaine in our Caesar salads. The Chinese recommend bitter gourd to whet the appetite and aid digestion. And cocoa beans provided the Aztecs with a prized beverage that was so bitter the dismayed *conquistadores* nearly missed out on the joys of chocolate.

All in all, it seems our forebears were right to investigate botanicals whose taste at first repelled them. Overcoming the resistance to bitterness has brought us far more weal than woe.

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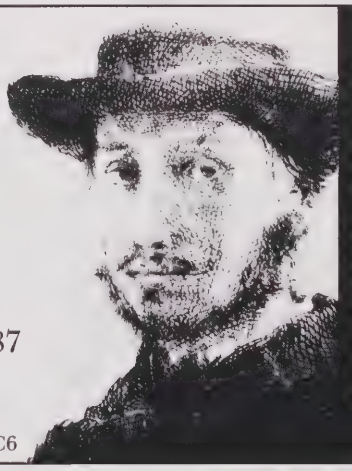

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SU-SIT'AATK

LOUIS LEVINE

The raising of two crest poles marked a new beginning for the people of Kitsumkalum

James McDonald

TOTEM poles, more accurately called "crest poles," are a unique feature of the aboriginal cultures of North America's northwest coast. Far from being a forgotten art, poles are still being carved from the towering red cedars that grow along Canada's Pacific coast. These wooden columns are important to the contemporary culture of aboriginal first nations such as the Tsimshian, whose carvers have won international acclaim for the quality of their work.

According to Tsimshian custom, the raising of a commissioned crest pole occurs during a spectacular public event, called a potlatch. In the summer of 1987, the Tsimshian community of Kitsumkalum, the "People of the Robin," held a massive potlatch to celebrate the raising of two crest poles and the installation of a high ranking chief. I was invited to participate in the event and to record the ceremony for ethnological purposes.

The village of Kitsumkalum, the focal point for about five hundred Tsimshian people, is situated on an Indian reserve adjacent to the municipality of Terrace, British Columbia. Organizers of the potlatch estimated that no poles had been raised in the Kitsumkalum Valley for more than 150 years,

A procession from the village of Kitsumkalum carries two newly carved crest poles to the site where they will be raised.

People from the region gather to celebrate the raising of the crest poles and the other events of the day.

LOUIS LEVINE

and therefore the production and raising of these two magnificent cedar poles, plus a third that Kitsumkalum gave to the city of Terrace, was a great achievement for the community. These activities demonstrated the community's strength as well as its intention to revitalize the Tsimshian culture and to take a more active role in the future of the province.

Su-Sit'Aak, which means "a new beginning" in the *sm'algyax* language of the Tsimshian peoples, was the name given to the celebration. The new crest poles have a very special meaning for the heritage of the Tsimshians and, indeed, for the heritage of all Canadians.

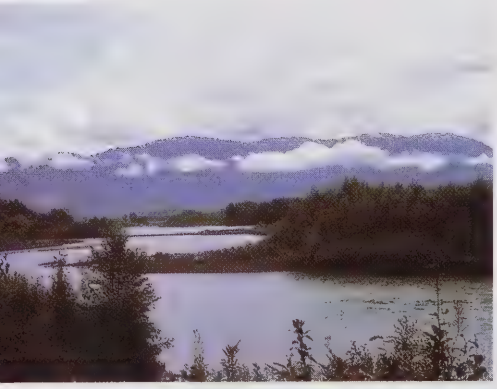
Preparations for the pole raising began in earnest during the preceding winter when the band council of Kitsumkalum sponsored a project for carving crest poles. This project was designed as an advanced class studying the highly formalized and academic style of crest art that is derived from the ancient crest system. The renowned master carver, Freda Diesing, who had taught several of the Kitsumkalum carvers in previous classes, was selected to instruct the students in the theory of crest designs as applied to cedar columns and in the proper techniques for large-scale carving.

The crest system is essentially a classification scheme that maps out the social relationships of Tsimshian society by providing a set of symbols for each family. These symbols are associated with the family's history and with its rights to supernatural powers, as well as to territories, resources, and other types of property. Families are the exclusive owners of their crests, and their ownership is registered and acknowledged at potlatches and other feasts.

Crest art, which uses these symbols, depicts the family histories and social relationships of the owners. The art is made from a variety of media, including the cedar columns for poles or the fabric of a chief's robe. The four crest poles just beyond the ROM rotunda and a chief's robe in the "From the Collections" gallery are superb examples of 19th-century crest art.

The day of the potlatch was Saturday 1 August 1987. A festive crowd, estimated at more than two thousand, gathered at the site of the pole raising outside the Kitsumkalum band administration building. The presence of guests at a potlatch honours the community and recognizes the right of the host to stage the event. In the case of *Su-Sit' Aatk,* the culture itself was being recog-

Top: The Kitsumkalum people have lived along the Skeena River for centuries.
Bottom: The main street of Kitsumkalum.



JAMES McDONALD

LOUIS LEVINE

The poles are raised part way and are held in this position while the history of the community is recited, the significance of the ceremony is explained, and any opinions are voiced. After everyone has spoken, if there have been no objections, then the poles will be raised to the fully upright position.

nized by the Indian and non-Indian residents of the region who were in attendance.

Following modern practice the guests carried the poles to the site as a tribute to the hosts. This was done under the watchful eye of a specially appointed pole captain, who forbade any pole carrier to laugh, to behave foolishly, or to be under the influence of alcohol or drugs. Respect had to be shown.

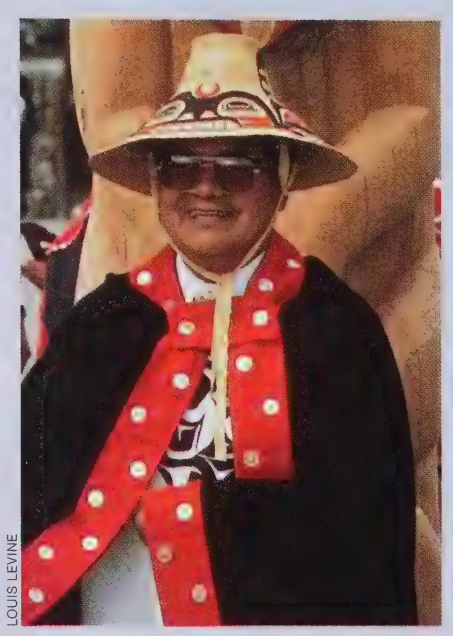
The stately procession that slowly followed the poles down the main street of the village was the community's formal presentation of its social and political structure. First came the elected and hereditary chiefs, immediately followed by the most important village elders; here was the governing board of the community. Behind these leaders marched the carvers whose skills and talents made the day's celebration possible. They were followed by the rest of the elders and the people of Kitsumkalum. Grouped together as a single civic body, the participants were expressing their desire to come together and to function as a community. Of course, they still displayed their family ties by the crests on their clothing, in accordance with traditional values, however, the dominant image of the community that they presented was of political and social unification.

After a brief welcome by the master of ceremonies and an explanation of what was about to happen, the poles were raised part way. A traditional pause before the poles were pulled completely upright made it possible for the guests to hear the history of the community and the poles, to understand the significance of the pole raising, and to voice any objections.

In explaining *Su-Sit' Aatk* to the audience, Chief Cliff Bolton of Kitsumkalum said that Canadian laws have made it difficult for the Tsimshian to retain their

Continued page 24

Comments about the raising of crest poles today



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Chief Clifford Bolton interviewed by the Native Music Heritage Society

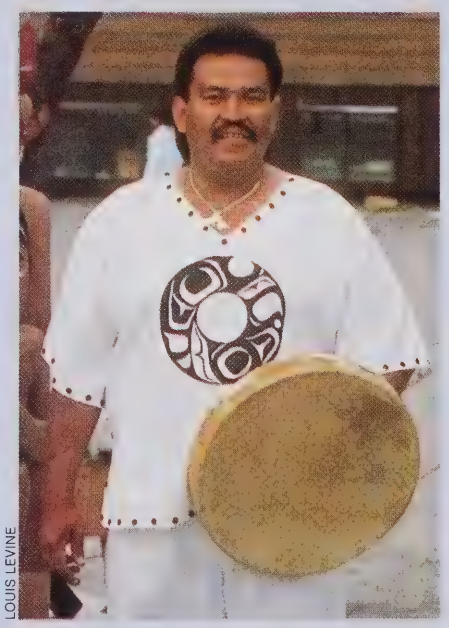
The culture is important to the Kitsumkalum people just as the culture is important to all the other tribes and all the other nations in the country, and in the world. People work very hard to keep their culture, and keep their identity—whether they be Indian or non-Indian people.

We as Indian people, through the laws of the land in the early parts of the century, have lost our culture, or were forced to stop practising some segments of our culture. In 1952 the law that banned us from practising our culture was lifted, and since then efforts have been made to carry these things on again.

We decided we would do this totem pole raising some years back, because we felt it was important that our people start over again in bringing back our culture. So our theme of these totem pole raising ceremonies is "A New Beginning."

With all the preparations and learning of the old traditional ways to the best of our ability, *Su-Sit'Aak* is a new beginning for our people. It's giving them a chance all to learn from the same level, from the beginning to the end of the totem pole raising.

So to us, this is very exciting, because there is a lot that had been forgotten. It didn't totally die out because it had been always around all this time, but now it's coming to the surface.



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Pole Captain Victor Reece interviewed by the Native Music Heritage Society

The significance of poles today in modern day gives our people another sense of a different kind of reality, in recalling history, and giving people a different outlook on what our culture was, and not what our culture is. The purpose of the poles, the significance of poles . . . is to recall history: the stories of individual chiefs, individual families, and individual clans. In the case of [Kitsumkalum], these poles are significant to [these people] in that they're recalling the history of one aspect of their culture, and that's being able to recall their own history, and thereby giving the people a sense of belonging again.

From my perspective, poles being carved and raised in modern day, such as these are, gives the children a sense of a direction, a direction to follow, thereby creating a stronger base on which to pursue life.

In fact, poles were significant in that they marked certain points in history, and certainly [with the two poles in Kitsumkalum] we mark again another point in history.

Although we have a slogan that says "A New Beginning," it's really taking a traditional idea and refreshing it, so that we can draw the youth back into our fold, and give them meaning, and give them strength so that they could face the world, and contribute to humanity, contribute to the people.

There's no one significance to poles. It's the visual part of a culture that recalls not only immediate history, but past history, and we could look at the future and say that yes, we do, we do have a direction. That's the significance of the ceremony of pole raising . . . for the new generation to understand that our contribution to the society as a whole, is a very significant contribution.

FREDA DIESING

Left: The crest pole of modern design is called Gila-Quoex, *which translates as robin. It is a twelve-metre long village pole representing all the people of Kitsumkalum and their future. The images on the pole refer to the story of the woman who married a bear, the primary crests of the people of the village, and the story of the founding of the ancestral Robin Village. The robin crest is at the top. From top to bottom, the identities of the crests and their carvers are:* Robin, *Lorraine McCarthy;* Man with a Fish, *Lorraine McCarthy;* Frog, *Norman Guno;* Wolf, *Freda Diesing;* Raven *Sandra Wesley;* Killerwhale, *Vernon Horner;* Eagle, *Myrtle Laidlaw;* Bear with Woman and Cub, *Dorothy Horner.*

Right: Nebah *is the name of the traditional-style bear-mother pole. Approximately eleven metres long, this pole is a replica of an ancient pole that was thought to have stood in Kitsumkalum territory. The log that was used was very long and the carvers did not wish to cut it short. Instead they elongated the design at the hat and added the robin crest on top, which represents the village. The other figures refer to the story of the woman who married a bear, and there is a hole that signifies the cave in which the bears hibernated. The robin at the top was carved by Lorraine McCarthy while the other figures were each carved by several artists.*

Carving the cedar crest columns

Freda Diesing interviewed by the Native Music Heritage Society

At first we started to do the one pole, and this was to be the village pole, representing two stories, and the crests of all the people in Kitsumkalum. At the bottom [the] pole starts with the Bear story, and then there's the Eagle, and the Killerwhale, the Raven, the Wolf and the Frog, . . . the top represents how Kitsumkalum got to be called the Robin Village.

After a while we decided to do a replica of an old pole . . . that had once stood at [Kitsumkalum. We knew it from] a picture that was sent from England by a traveller at the turn of the century. This was the Bear story pole [which] represents a myth of a woman, a berry picker, who was captured by the Bears, and lived in a cave in the mountain with her Bear husband [with whom] she had two cubs. The pole includes the large Bear, the woman with a cub, the cave in the mountain, another Bear and then the man, and on top we decided to put a Robin. We put a Robin on top . . . to signify that it's Kitsumkalum.

After we decided to do the second pole then we decided it would be a good idea to give a pole to the city of Terrace, so we ended up doing three poles instead of one, which was a big job but good experience for the carvers in that they had to really rush with them to get it done in the time. Also, it's good experience to put forward the knowledge they had in doing the first one. It was just like a test, having to do the other poles.

Freda Diesing (left) explains the carving of a pole to two visitors.

JAMES McDONALD

culture. This celebration was his generation's way of telling the children that the next generation will have to be prepared to fight for the survival of their culture.

The chief then went on to say that one pole, carved in a modern style, has all the major village crests on it to represent the whole community. Dedicated to the children, this pole signifies the future. The other pole, a replica of an older pole, displays crests of one of the ancient families of Kitsumkalum. This pole represents the past and shows respect for the elders who have died, the cultural heritage of the ancestors, and the generations that suffered during the period of harsh Canadian assimilation policies.

After the chief's talk the polite veil of ceremony dropped to reveal the serious face of otherwise subtle negotiations. Guests were permitted to openly dispute the right of the host to use any of the crests, to raise the pole, or to use the histories. They could challenge the village's right to hold the ceremony or question some aspect of the ceremony's ritual and symbolic structure. They could also dispute the claims to the territories mentioned in the stories represented on the poles. Any legitimate complaints by the guests would have disgraced the hosts and could have ended the ceremony. All that had been accomplished in the community would have suddenly come undone.

While the poles remained partially raised, a chief from a neighbouring village rose to the microphone and asked permission to speak. As a high-ranking titleholder, his opinion was important and the audience listened carefully as he expressed his intention to comment on the pole raising and to sing an important song as a tribute to Kitsumkalum.

When all was said, Kitsumkalum's right to raise the poles had not been questioned. After the last speech the pullers were asked to finish their work by raising both poles simultaneously.

> Today's your day . . . to experience history in the making. Today you'll be seeing, for the first time, two poles being raised simultaneously—a tribute to a great culture, a tribute to an idea . . . we can still retain what was once so beautiful and so proud.
> *(Victor Reece, Pole Captain)*

The approach to raising the poles was unique and this gave Kitsumkalum a certain prestige. This was the first time that two crest poles had been pulled up simultaneously, and the sight of both columns raising their heads into the sky was spectacular. It was also the first time that both traditional and modern methods were used simultaneously to raise poles. The traditional pole was lashed and hoisted in the traditional manner; the modern-style pole was rigged with a modern pulley system. Using two methods to raise the poles was intended to add emphasis to the contrast between the past and the future.

After the poles were secured, the carvers celebrated with an enthusiastic performance of the special Robin Dance and Robin Song, in accordance with the crest privileges of the "People of the Robin." The pole raising was officially over.

All of the cultural premises and values that had guided the day's ceremonies had been validated. The potlatch feast that followed with an installation ceremony for a titleholder allowed the people of Kitsumkalum to show additional respect for their ancient Tsimshian culture and to further demonstrate their ability to use that heritage to redefine and enrich the present. During the feast program, all those who had taken an active role in the preparations and rituals of *Su-Sit' Aatk* were compensated with gifts of blankets and money. Other gifts were given to the audience for witnessing the ceremonies and thereby recognizing the cultural themes of *Su-Sit' Aatk*.

Chief Bolton summed up the importance of *Su-Sit' Aatk* when he said, "I hope that the younger people will take this as a go-ahead to [encourage] them . . . to get into other areas of our culture, like our language, and other ways that our people had lived. We can't go back to the old ways completely, but there are parts of it that we can use along with today's way of living . . . I have to say that it's a very proud moment for our village . . . Also for all the people in this area—native people and non-native people alike."

Dr. James McDonald is assistant curator in the Department of Ethnology, ROM.

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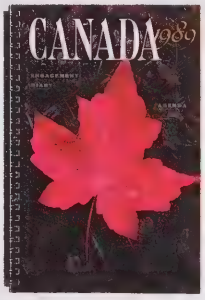

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MOMI
A TOUGH ACT TO FOCUS

Will London's new Museum of the Moving Image prove to be an ingenious approach to a vast subject or is it doomed to failure?

Noah Richler

IT'S the Year of Cinema in Europe, it's the Year of Not Smoking, and in the United Kingdom it's the Year of Living Even More Dangerously if you depend on government at all. Schools, libraries, teachers, artists, the National Health System, the BBC, the (uggh) *unemployed*—pariahs all: they are unwanted extras in Thatcher's revisionist Robin Hood panto. Herald the Free Enterprise Culture, and phooey to the idea of the Public Good.

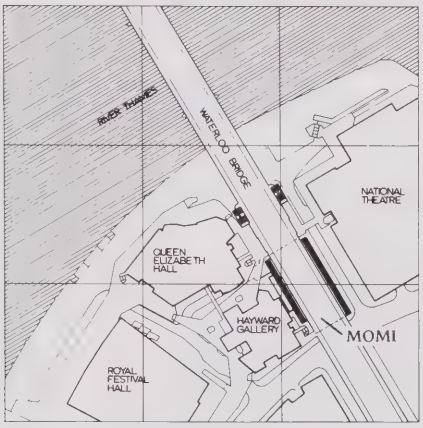
So it is quite remarkable on the one hand, a vindication of Thatcher on the other, that the Controller of the National Film Theatre, Leslie Hardcastle, the NFT Archivist, David Francis, and Antony Smith, the Director of the British Film Institute, have managed to raise, without government support, some £10 million ($23.5 million) for the building of MOMI, the new Museum Of The Moving Image. "A miracle," says Hardcastle bluntly. "This project has made me want to write a book called *1988: Can't.* My grandmother used to tell me you could do anything you wanted. Now everybody says *you can't.* To raise that kind of money for David Francis and myself in Great Britain in 1988, that's a miracle."

PHOTOGRAPHY COURTESY MOMI

David Francis (left) and Leslie Hardcastle are the co-ordinators of the Museum of the Moving Image.
Facing page: MOMI is located under two of the arches of Waterloo Bridge in London.

The museum, the directors intend, will "trace the development of moving images from Chinese shadow plays of 5000 years ago to fibre optics and satellite images of the present." Fittingly (and fittingly was a difficult job for the architect) in this economic climate, it sits under two of the arches of Waterloo Bridge on London's South Bank: no one can afford to be too grand after all, and the price of London real estate is completely absurd. An old rubbies' rainstorm haunt, it's squeezing out the homeless, but so it goes.

Conceived some fifteen years ago, and planned to celebrate the 50th anniversary of the British Film Institute in 1983, Leslie Hardcastle's project began in earnest in 1982 and will finally open on 15 September, some six months later than expected and at double the estimated cost of £5 million ($11.75 million). The long wait for the museum has created an atmosphere of controversy and anticipation. "They have been completely secretive," says Robert Lumley, lec-



turer in art history and communications at Coventry Polytechnic. "They've been treating it like a new car model. They're not giving anything away. That's a new development in museums."

And one which belies the commercial aspect of the enterprise. It is estimated that MOMI will require 450 000 paying visitors each year to break even. This will be no problem, according to Hardcastle. "A normal person in England watches an average of more than twenty-four hours of television a week. By the time you're eighteen you will have spent two years watching television. Two years—not reading books, watching television. And that's just a *normal person.*"

From an architectural point of view, the museum is undoubtedly an ingenious feat; in siting it underneath the Waterloo Bridge arches and over an underground parking lot, it was necessary to take into account leaks, vibrations, acoustics, and the actual physical shifting of the bridge itself. The museum has solved the riddle of available space and lies in close proximity to the theatres, galleries, and concert halls of the South Bank, and to the National Film Theatre of which it is in reality a part. The red bubbles of its roof, the glass wall panels (which can be used as movie screens), and the exposed structural limbs make the house noticeable, if not quite obtrusive, amid the otherwise straight-faced concrete buildings of the South Bank complex. "Under the bridge," explained the architect, Avery, "we don't have any profile. There are two approaches you can take: you can either design an introspective building, like the Royal Festival Hall or the Queen Elizabeth Hall, which is dark inside and presents the public with an impenetrable face. Or you have to do something jolly."

Jolly? Avery's design pleases Hardcastle and Smith, who speak in video-age terms (not always completely convincing) of what is new and modern about the place—the need for *magic* and for interactivity, the need to be entertaining, to be *fun*. Not so pleased is David Roper, London arts reporter and CBC contributor, instructor in journalism at London's City University and dedicated film enthusiast. "It's in an awful position," says Roper. "No one's even happy about the NFT being stuck under the bridge, so why did they go to all that effort to put the museum there? The whole of the South Bank is already such an architectural mess. I think they're stuck with a monstrosity—those dreadful red bubbles, that plasticky architecture. It's all very *sixties*. There's nothing appealing about it at all."

Even before its construction, the very concept of the museum posed problems. Museums are opening at the rate of two a week in Britain (no one keeps a record of their closures), which means either that Britons are a far keener, culturally more devouring, lot than even we give them credit for, or that the meaning of the term *museum* has been diluted beyond any real usefulness. Is MOMI a museum or, to use a phrase increasingly current, is it merely an entertainment enterprise?

"The British Museum and the Science Museum," says Hardcastle, "are places of learning and of national collections, but MOMI is one of a new breed of 'participatory' museums. Our national heritage museums are like that—they'll show you what life was like in Wigan in 1900, or tell you the story of a particular industry. However, the subject of the moving image is entirely different. It's so vast. We're travelling from 2500 B.C. to today and into the future. We're trying to relate how images have affected our lives, our appreciation of others, our relationship to society. Most museums are either wholly academic or a combination of academic pursuits and occasional exhibitions of interest to the general public. We are concerned absolutely with the general public. MOMI's an academic pursuit but it's always an entertainment."

A museum must retain its conservatory and academic aspects; otherwise it is no more than an exhibition. Museums *are* seats of learning, which today have been forced to respond not just to new financial constraints, but also to the more sophisticated expectations of their visitors. What's more, they have film and television for rivals—somewhat of an irony here. Surely television or the repertory cinema performs the documentary function of a museum of

images—celebrations of a particular actor or film-maker, treatments of a certain theme—perfectly adequately, if not better? Lumley thinks not. "Insofar as MOMI is dealing with *images,*" he says, "I think they have a whole new territory. A repertory house could put on a festival of montage, perhaps, but MOMI can actually go behind the image, and explain montage from a physical aspect. Those things could be done elsewhere, but the point is no one else is actually doing it."

David Robinson, film critic for the *Times* and himself the proprietor of a substantial collection of film relics and memorabilia (he recently bought, on MOMI's behalf at a Christie's auction, Chaplin's hat and cane for a whopping £15 thousand), claims that "the easy part is to chronicle technological evolution . . . MOMI's most essential task is to capture and convey the magic and the mystery that constitute the movies."

No simple task. Chronicling the technological evolution could well be neither easy nor, in its result, particularly evocative. Any picture of a film crew at work is immediately more exciting, more romantic, more evocative than observing a camera in isolation. "I don't think that cinema should have museums at all," says Roper, the spoiler still. "Even gathering the artifacts together doesn't succeed. A radio museum doesn't convey what radio is about by showing you wireless sets, or a theatre museum by showing you playbills. MOMI's always going to be inadequate, and it's condemned before it even *starts* to be inadequate. The material and the technology don't tell you what cinema is about at all."

To counter this objection, Hardcastle *et al* have gone to special and imaginative lengths to enliven MOMI. (Colin Ford, Director of the Bradford Museum

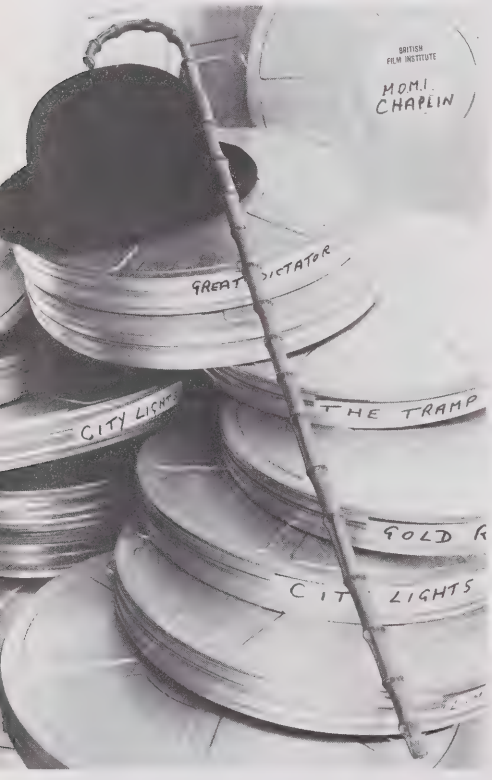
The set for the Russian agitprop train.

of Photography, Film and Television will tell you right away that their most popular exhibit is one in which children are able to read television news and then watch themselves played back on video.) "It's a hands on, open access museum," says Hardcastle. "Everything about it is conceived in that way. The guards are actually actors. In one place they will take on the role of a TV producer, in another a vision-mixer. There will be a slide man who will get into the *Magic Lantern* and make that work; another will be a guard on the Russian agitprop train. They will never leave the period in which they are supposed to be acting. They'll learn the languages, the phraseology, everything. When they change they'll do so in a Hollywood studio wardrobe department, under public view, in an exhibit about making up the actors for *Gone with the Wind*. It even has all the dress-fitting notes for the next day."

Is that for the Clark Gable or the Tom Selleck version? A museum, a theatre, or a gimmick? This is the charge of which curators are especially wary. "The idea is to make the information as accessible as we can. That can be very vulgar if you're not careful. It can be lightweight."

These are measures that bring to mind the tremendously successful *Cités-Cine* exhibition, which opened last winter in Paris at the Grande Halle de la Villette (once a slaughterhouse) and enthralled visitors for five hours at a time. Ticket-holders entered the enormous exhibition and walked through a screen onto which *Metropolis* was projected. They wandered about the magnificent sets—a *Métro* tunnel, a Parisian rooftop, the Berlin Wall, a hall of enormous *Ben Hur*-like props, each one with its own screen and movie clips—wearing headphones that picked up the soundtracks. After an hour or two visitors could eat a sandwich or drink a glass of wine at a café, which was part of the *Berliner Strasse* set. Smith and Hardcastle, forgivably envious of the sizeable financial support that the exhibition received from the French government and from the city of Paris ("a different culture," Smith sighs) are also curiously disparaging of it. "The material was already showing wear and tear after a month," says Smith, as if that was the pertinent point. Forgoing Chaplin's hat and cane, the *Cités-Cine* exhibition recreated the "magic and the mystery of the movies" fantastically, sensibly elaborating on just a single theme—cities in cinema—in a far, far larger space and *still* there were omissions. MOMI is different neither in object nor in principle from the *Cités-Cine* exhibition (which recreated the "magic" not least through its sheer grandeur), except that it has chosen to cover five thousand years and not fifty, and in what seems like a closet in comparison. Robinson is right: it's a considerable task.

Charlie Chaplin's hat and cane, along with other icons of film and television history, will be on display at the Museum of the Moving Image.



There is great enthusiasm at MOMI, but one is suspicious that by seeking to achieve too much, MOMI will fail. MOMI is not quite a museum (Francis calls it the "third arm" of the NFT and the BFI), yet it is not an exhibition because the various exhibits are permanent and unchangeable. Designed by Neal Potter, a designer of exhibitions but without any profound experience of cinema, some of the exhibits operate on a level uncomfortably close to banality: TV monitors inside the door of Downing Street to show the medium as a political tool. How many of the 450 000 will come to see that twice? *Cités-Cine* closed after three months. Smith talks of refurbishment, but every five years perhaps; this in an age when the pace of technological change is so rapid that it is unlikely he will be able to maintain MOMI's currency, one of the pretensions the museum has made if only in its architecture. Without an IMAX screen, without paintbox, without today's plethora of toys, Smith's claim is spurious.

MOMI professes archival links with the National Film Theatre, but does not contain in itself any significant facilities for research. The British Film Institute, it is true, already has the largest library of film in Europe, but the film archive was moved to a safe building outside London after a fire damaged much of the stock. If MOMI is the "third arm" of the BFI and the NFT, the directors might have considered the clear inadequacies of the facilities of the NFT at least. The NFT runs an excellent film program, but its tiny cinema, which seats only 460, makes that institution and its archive patently inaccessible in the face of real demand. And MOMI, striving to tell what it considers

The British Cinema exhibit is designed by Neal Potter.

to be a five-thousand-year-old story, is doing so through what appears to be only a sporadic and whimsical use of artifacts. This, furthermore, when it is very likely that the ability to present the *authentic* object is one of the few prerogatives left to the museum in the media battle with film, television, and—let's not forget—books.

Doctor Chivalos is the curator of a kindred venture, the Theatre Museum in Covent Garden. A branch of the Victoria and Albert Museum in Kensington, it also charges an entrance fee. Despite a location that is unquestionably more advantageous than the South Bank, and which could not be closer to the throngs of West End theatre-goers—prime candidates for visitors, one would have thought—attendance there is at forty per cent of projected levels. On that count at least, the Theatre Museum is a flop. Even the café does badly: you have to pay the entrance fee in order to eat there. And more bad tidings for MOMI: those rubbies sit under the arches not only to keep out of the rain, but also because they're not bothered there.

Furthermore, if MOMI and the Theatre Museum embark on collections, their problem, in such recent fields of history, will be one of *selection* rather than collection. There is something untrustworthy, and rather brazen, about attempts by these museums to decide for tomorrow what is important about what happened a little sooner than yesterday, particularly when there is such an abundance of relics, memorabilia, and possibly junk. "It's always," says Chivalos, "a matter of what you leave out." These museums need editors more than curators. There is also, it would appear, a paradox at the very core of any museum that takes one of the performing arts for a subject. "You have to be very careful from the outset of what is the definition of a museum. MOMI and the Theatre Museum face an additional problem. Essentially a *theatre museum* is a contradiction in terms. There is theatre, which is a living art, and the museum, which is concerned with remains. Relics can give you some indication of the performance, but they are only remains. All you can do is try to supply these pieces of evidence, and to display them in an interesting, evocative, imaginative way. You cannot ever recreate the performance. With a movie it's the same.

"The way in which to minimize the contradiction—you cannot ever resolve it—is not by gimmicking the presentation of the evidence. We have always resisted this. A museum has a populist function, but there must be no confusion created in the public's mind about what is true—what is real—and what is

The Temple to the Gods is an amusing tribute to the greatest stars of the silver screen.

false. If you look at a costume which says this was worn by Nijinsky, you must be certain that it is not an approximation. It must be the real object. That is the museum's strength. If it is a museum of film, they you want to see the Oscars. You want to see the real thing."

This question of authenticity does not appear to preoccupy Hardcastle at all. "We are not ashamed of making models or reproductions. We don't want Marilyn's original dress, but we do want a reproduction of it, absolutely as it was going to be worn by her, to evoke the feeling and the spirit of the time. We're not a museum of artifacts. There are other organizations for that. People think we're Bradford. We're not Bradford. It's right that Bradford should have the first CinemaScope lens, the first Mitchell camera mechanism. We're not interested in the *first*, or even the second. We just want one. Or what looks like one."

Bradford, in Yorkshire, is where the National Museum of Photography, Film and Television—a branch of the Science Museum (and government-funded)—is situated. Smith is sore about repeatedly having to face the question "What about Bradford?" He pretends a chummy relationship—it is a lot easier for the upstart MOMI not to be irritated with Bradford than vice versa—and maintains that the two museums are not rivals. In so far as Bradford is near impossible for even an obstinate tourist to get to from the south of England, it is true that MOMI does not compete. Proponents of a national museum policy for the United Kingdom, however, object: MOMI is competing for consumer attention and for funds. They are mindful of the appalling economic inequities of the country's "north-south divide," and see a dispersion of museums in the regions as a means of creating jobs in these areas. A MOMI in London, even beyond the question of mere duplication, is repudiating this effort. These critics also maintain, somewhat churlishly perhaps, that because the pool of financial resources is continually shrinking, MOMI has resulted in the diversion of funds from more worthy causes such as the expansion of the BFI or the salvation of countless nitrite film stock currently deteriorating beyond repair. That MOMI aims to be a self-financing venture makes little impression on one critic. "If a restaurant opens and it pays for itself," he says, "what value does it offer anybody else?"

Ah yes, the Public Good. Who still makes room for that in a required rate of return? "I judge my museum to be a success," says Chivalos, "if it makes someone want to go to the theatre." That is a more generous kind of criterion by which to judge this intrepid venture.

Noah Richler is a producer for BBC Radio in London, England, and a freelance writer.

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There is no end in sight to the debate over the appearance and behaviour of the greatest killer dinosaur

T. REX Exposed?

Don Lessem

FOR the century that we've known of the greatest of all killer dinosaurs, *Tyrannosaurus rex*, artists and palaeontologists have done their utmost to represent it faithfully. Some have done so brilliantly, but few have concurred in all details of their portraits. And all may have gotten the dinosaur in one way or another, wrong.

As our knowledge of dinosaurs and their habitats expands, researchers come nearer to agreement on many aspects of dinosaur anatomy and behaviour. But many new gaps of controversy and conjecture are opening, and so the ways of picturing dinosaurs is increasing among palaeontologists and artists alike. How three contemporary American dinosaur depictors—one an artist, one a palaeontologist, one involved in both professions—treat the most fearsome yet beloved Canadian-American dinosaur reveals how consensus and controversy continually reshape the image of *Tyrannosaurus rex*.

COURTESY S. CZERKAS

The vicious nature of *Tyrannosaurus rex* is clearly expressed in this model created by Sylvia Czerkas.

The best evidence of *Tyrannosaurus rex* remains the first: two partial skeletons found in 1902 and 1903, one in Montana and the other in Wyoming, and one nearly complete skeleton, found in 1908, again in Montana. Approximately 14 metres long, *Tyrannosaurus rex* was built to kill. It was possessed of forward-set eyes that gave it depth perception unrivalled among dinosaurs. What it saw and caught, it gnawed with scores of saw-edged, 17.5-centimetre-long teeth set in a highly flexible 1.2-metre-long jaw. And it was the largest hunter to walk the Earth.

Palaeontologist Henry Fairfield Osborn of the American Museum of Natural History in New York named the "tyrant reptile," and described it in 1905 from the first specimen found. The second specimen, narrower in the jaw, was first named *Dynamosaurus*, but soon was reclassified with the similar later find, as a fellow member of the species *Tyrannosaurus rex*. *Tyrannosaurus rex* has since been found across the North American west and a closely related, if not identical species, *Tarbosaurus*, was uncovered in Asia. Among the most recent *Tyrannosaurus rex* specimens is one found three years ago at Dry Island Buffalo Jump in Alberta, along the Red Deer River north of Drumheller's Tyrrell Museum of Palaeontology (where it is now being restored).

Tyrannosaurus rex was the last of the great predators of the final dinosaur period, the Cretaceous, some 65 million years ago, and its ancestors included *Albertosaurus*, a more lightly built genus named by Osborn for its Canadian origins. The behaviour of *Tyrannosaurus rex* is little known. Clearly it was equipped to run and kill, though it may also have been a heavy consumer of carrion.

But as for what *Tyrannosaurus rex* actually looked like, generations of palaeontologists and artists have taken their inspiration from the reassembled Montana tyrannnosaur skeleton in the American Museum of Natural History and its first painted representations by Charles R. Knight. Reconstructed in 1911, in an upright, open-jawed pose, it continues to tower over visitors to the dinosaur halls. In the reconstruction several vertebrae were wrongly added to the tail by palaeontologist Barnum Brown, allowing it to serve as a prop to support the beast in a fearsome pose.

The skeleton's upright, tail-dragging pose became the model for decades of *Tyrannosaurus rex* sculptures and paintings that conform to a view, only lately abandoned, of dinosaurs as lumbering, witless behemoths. The most widely distributed sculptures of this genre were casts of a bloated, fat-headed *Tyrannosaurus rex* produced by Louis Paul Jonas for the 1960 New York World's Fair (one remains on prominent display at the Boston Museum of Science).

Robert Bakker and Stephen Czerkas were among the millions of children who stared at the American Museum *Tyrannosaurus rex* skeleton, open-jawed themselves in awe, and vowed to become palaeontologists. Bakker and Czerkas have been true to their promise, but they now see and depict tyrannosaurs in very different ways.

Today Czerkas, a shy and serious man in his mid-thirties, is the leading sculptor of dinosaur replicas in the world. He has built a one-fifth scale

Charles Knight, the first of the great dinosaur artists, created the scenes pictured below and on the facing page. The first scene, which shows a *Tyrannosaurus rex* confronting a *Triceratops*, is one of twenty-eight murals of prehistoric life that he created for the Field Museum in Chicago. Knight created the *Tyrannosaurus rex* battle for the National Geographic Society.

COURTESY S. CZERKAS

PAINTING BY CHARLES KNIGHT, COURTESY OF THE AMERICAN MUSEUM OF NATURAL HISTORY

Tyrannosaurus rex sculpture, and last year he designed a full-scale *Tyrannosaurus rex* replica that is now displayed in an entire dinosaur hall of Czerkas creations at Taiwan's Natural History and Dinosaur Museum. Czerkas, a self-schooled palaeontologist, is also the world authority on stegosaur anatomy and dinosaur skin.

Of the American Museum skeletal reconstruction Czerkas says, "It was a giant step backwards from the start for representing *Tyrannosaurus rex*. Why they added those vertebrae is a huge mystery to me." As for the Jonas sculpture, "It looks like an overstuffed sausage, incredibly fat and woefully inaccurate."

Bakker, a few years older than Czerkas, is a talented illustrator of dinosaurs. His art is, however, incidental to a career as one of the most influential of dinosaur palaeontologists and certainly the most controversial—a long-haired, voluble, self-described "outlaw." Bakker has drawn *Tyrannosaurus rex* engaged in vigorous activity many times; one of his drawings, made for his best-selling 1986 book, *The Dinosaur Heresies*, shows it confronting two *Triceratops*. For a display mounted last year at the Denver Museum of Natural History, Bakker reassembled a cast of the American Museum's *Tyrannosaurus rex* bones, without the extra tail vertebrae. He balanced the skeleton on one foot, with the other poised to strike, giving it a more horizontal trunk and a tail held high, "It looks towards the door, mouth open, as if ready to pick up the visitor," says Bakker.

It has taken more than seventy years for Bakker, Czerkas, and others to remake the public image of tyrannosaur's skeletal anatomy. But when it came to putting flesh on dinosaur bones in that interim era, artists might have created a far livelier tyrannosaur had they emulated the first *Tyrannosaurus rex* illustrations, the drawings and paintings of Charles R. Knight.

Born in 1874, Knight was "the first and undeniably the greatest artist" depicting prehistoric life, according to his biographer, Sylvia M. Czerkas, a *Tyrannosaurus* sculptor in her own right, and Stephen's wife. Until his death in 1953, Knight drew and painted hundreds of dinosaurs and other prehistoric creatures in active poses and dramatic scenes for museums, books, and magazines. He kept a menagerie of pets, visited zoos around the world, and studied dissection, all to make his images more vivid and realistic. And that they were: one toothy *Dryptosaurus* leaping on another, an *Allosaurus* ripping at the flesh of a dead *Apatosaurus*—to name but three of the dinosaurs that Knight brought to life.

Knight acquired his enthusiasm for depicting animals as a child in New York visiting the American Museum. Supported by Osborn, his longtime benefactor, he began painting *Tyrannosaurus rex*, an animal he called "one of the most mighty and awesome of creatures," as part of a mural for the museum in 1904, even before a *Tyrannosaurus rex* skull had been unearthed. Yet his *Tyrannosaurus rex*, shown close-mouthed, approaching two adult *Triceratops*, their baby cowering behind them, is "very accurate indeed," says Bakker. "The snout is a little short, the thighs not thick and birdlike enough, but in all very nice."

Knight made his share of wrongful suppositions; for example, he put a grassy foreground in the scene though grasses had not yet evolved. He neglected the abundant small mammals, reptiles, birds, and insects of the time. But, says Czerkas, "Knight had a great deal more insight than palaeontologists of his time and long after. If you look closely he has the tail of his *Tyrannosaurus rex* off the ground. Not high enough maybe, but it is in the air."

Anatomical details aside, Knight's depictions of *Tyrannosaurus rex*, particularly those in his masterwork—a set of twenty-eight murals of prehistoric life for the Field Museum in Chicago—have themselves inspired many youngsters to careers in palaeontology and palaeo-art. One was Tyrrell Museum palaeontologist Philip J. Currie, who wrote in an essay for the second volume of *Dinosaurs: Past and Present* that Knight's *Tyrannosaurus rex* mural was "a significant influence on my decision as a child to become a palaeontologist" and "has the same impact on me now as it did when I was young. Another was

Facing page: Although Mark Hallett's illustrations, *Horns and Beaks versus Claws and Teeth* (above) and *Awakening of Hunger* (below), are considered, for the most part, plausible renderings of *Tyrannosaurus rex*, his use of bright colours on the dinosaurs' skin has been controversial. Renegade palaeontologist, Bob Bakker, believes that Hallett's colourful dinosaurs are most credible. Stephen Czerkas strongly disagrees.

Mark Hallett. Hallett is now forty and, along with John Gurche and Doug Henderson, among the best and best-known of all dinosaur painters.

Hallett saw his first Knight dinosaurs at age three, in a black and white illustration for Edwin H. Colbert's *Dinosaur Book*. "They looked amazingly like a photograph. I asked my mother if dinosaurs were still alive," he recalls. This was the identical reaction that Stephen Czerkas had at the age of eight when he saw the same book: "It was so detailed, so lifelike, I thought it must be a photograph."

Like Knight before them, Hallett, Czerkas, and Bakker, with precocious talent, began drawing giant creatures at an early age. They continue to do so passionately in adulthood, depicting *Tyrannosaurus rex,* among other dinosaurs, by studying the most current fossil evidence and the most appropriate living specimens. Yet their results differ from head to tail, and at several points in between.

Hallett paints from his backyard garage-turned-studio in Pasadena, California, surrounded by dinosaur images, fossils, hippo teeth, and ostrich eggs. Schooled as a medical illustrator, Hallett has been a freelance illustrator specializing in painting prehistoric life for books, magazines, and museum murals like those of Ice-Age mammals he did for Los Angeles's Page Museum. Hallett has reviewed his own rigorous preparations for his illustrations in an essay, "Bringing Dinosaurs to Life," for Volume I of *Dinosaurs: Past and Present.* He begins by reading "everything I can" from scientific literature on the dinosaur he will illustrate, and occasionally joins a palaeontological dig for a particular animal before rendering it.

Next he produces pencil sketches, of which three to five are shown to the client and often to the client's scientific adviser as well. They select one which Hallett then enlarges into a complete sketch, with studies of light sources, behaviours, and reconstructions of bones and muscles until "I'm confident that I can handle how they looked." Hallett may do his final drawing with an ordinary pencil. A grey gummy eraser lies close by from which he can "make nice sculptures if I get bored." He insists, however, on using the highest quality illustration board or linen flax for larger pieces. His final works are seldom even remotely as monumental in size as their subjects—his largest mural is 9 x 2.4 metres, and many Hallett paintings and drawings are no more than 50 x 75 centimetres.

Hallett's depictions of *Tyrannosaurus rex* include two scenes created in 1985 for a Zoo Book series for young readers. His *Horns and Beaks* features two lithe specimens of *Tyrannosaurus rex* wheeling menacingly in the dust about a herd of *Triceratops*, which are arrayed, horns outwards, in a defensive circle. There is no scientific evidence for the formation, but, Hallett says, "palaeontologists, Bakker among them I believe, have suggested they might do this. Musk oxen do, and dinosaurs might have done many things like modern mammals." The bare setting was chosen to concentrate attention on the dinosaurs; and while it does not correspond to the subtropical scenery of much of North America at the time of *Tyrannosaurus rex,* it isn't far from the semi-arid conditions that *Tarbosaurus*, its close cousin, faced in Asia.

Hallett did show *Tyrannosaurus rex* in a lushly and appropriately vegetated scene in a second illustration, *Awakening of Hunger,* a frontispiece for a book in the same series. For that work Hallett says, "I had no particular behaviour in mind." Rather he was interested in showing a fully restored tyrannosaur in the same pose as the museum skeleton depicted on the book's following page.

In portraying the dinosaurs, Hallett says he followed "the best palaeontological evidence available" including the posture studies of Gregory S. Paul, a Baltimore palaeontologist and artist. "I'm basically conservative in my approach. I put its tail off the ground, and its feet under its body, not straddling the ground like a reptile. Dinosaur trackways show a narrow gait, not a sprawling reptilian posture, and no tail marks."

Hallett's approach was also conservative in details about which palaeontologists lack conclusive evidence. He followed Czerkas's lead in making a

COURTESY S. CZERKAS

Sylvia Czerkas tickles the chin of Stephen Czerkas's life-size model of *Tyrannosaurus rex*, which was created for his gallery of dinosaurs in Taipei, Taiwan.

pattern of rosette-shaped tubercles on the skin, and placed small horns over the eyes, corresponding to the knobby, highly vascularized protuberances on tyrannosaur skulls.

Australian palaeontologist Ralph E. Molnar reviewed Hallett's preliminary *Tyrannosaurus rex* drawings and made suggestions. Among them, Hallett recalls, "that I straighten the neck. I had it too humped with musculature."

Where Hallett has been controversial is in the colouring of his dinosaurs. In the absence of any evidence of their pigmentation, he has used green with magenta and brownish stripes in a disruptive camouflage pattern. "They probably needed a pattern to break up their huge body size, like a tank on manoeuvres, to hide from their prey."

Bakker believes Hallett "comes the closest of all artists to the modal range of possibilities" in coloration, and other aspects of representing dinosaurs. "Colour evolves quickly," says Bakker. "These animals are so close to birds. Consider the variety of brightly coloured feathers that different species of male birds display in breeding season. With the different habitats tyrannosaurs lived in, they could have varied from pink and coral to dark green." But to Stephen Czerkas, otherwise a friend and admirer of Hallett's work, "Hallett has gotten really wild in colouring dinosaurs."

Czerkas is a man so conservative in his view of dinosaurs that he adheres to the now minority view that the animals were cold-blooded. Like Hallett, Czerkas lives in the Los Angeles area, in a home surrounded by dinosaur artifacts, among them a man-size dinosaur shoulder bone and several works by Charles Knight. A multi-horned, 1.2-metre-long rhinoceros iguana named Don (as in iguanodon, the dinosaur-age reptile he resembles) is caged in the yard. Czerkas examines Don regularly, if gingerly, as an anatomical reference for his dinosaur sculptures. He and Sylvia also go on annual digs—this year to Patagonia—in search of skin from carnivorous dinosaurs.

Czerkas does his sculpting in a Quonset hut in Pasadena, working by hand with non-drying clay. In an exacting, often tedious process, he builds dinosaurs from the inside out—creating skeletons, overlaying them with muscles, and then applying textured skin.

How meticulous is Czerkas? He had just completed his first full-sized replica, the *Allosaurus*, hand-stamping, scale by scale, a skin pattern borrowed from a duck-billed dinosaur in the absence of any finds of carnivorous dinosaur skin. In 1985, when he learned from Dr. José Bonaparté of a skin find, from a meat-eater, *Carnotaurus*, in Patagonia, Czerkas erased the entire pattern and started over. "The rosettes were different, keel-shaped. I had no choice."

Where Czerkas has had to choose, in the absence of hard anatomical evidence, he's taken a no-frills approach. His Taiwan *Tyrannosaurus rex*, feet firmly

COURTESY BOB BAKKER

Bob Bakker is probably the most controversial and outspoken palaeontologist in North America.
Facing page: Both a palaeontologist and an artist, Bakker has created the most aggressive, mobile, and agile version of *Tyrannosaurus rex*. Mark Hallett and Stephen Czerkas contend that Bakker's interpretation of this dinosaur as an extremely active creature is exaggerated.

planted as it confronts a full-scale *Triceratops*, is grey-green with brownish banding, colourful only by contrast with Czerkas's other work. Muted tones notwithstanding, his *Tyrannosaurus rex* exudes life. Muscles appear to bristle beneath the thin bumpy skin of the fibre-glass mould, holding the tail and neck high. The mouth is open, poised to strike.

Czerkas does add frills, literally and controversially, around the eyes. "Even Knight had some ornamentation on the faces of his *Tyrannosaurus rex*," as Czerkas points out. But he takes the decoration further. In his view skull bumps were an indication of far more prominent horns, frills, and bumps on the face of *Tyrannosaurus rex*, decorations useful not only for display among males for female attention, but as vents for controlling body heat in cold-blooded animals. So he gives his*Tyrannosaurus rex* bulbous pointed horns around the eyes and nose, "like my rhinoceros iguana, which has several horns but indications of only one on its skull."

"Nonsense," says the ever-blunt Bob Bakker of Czerkas's horned *Tyrannosaurus rex*. "If the horns were thermoregulatory organs they'd stick out like a radiator cap. If they were big horns they'd have had to show up on the skull, with indications of the much larger blood supply that would have to go through the bones." With a specific behaviour, not previously considered for tyrannosaurs, in mind, Bakker contends, in research he will soon publish, quite the opposite: the horns of tyrannosaurs like *Allosaurus* were flattened.

"*Tyrannosaurus rex* was a head-butter," says Bakker. "The bumps are low butting platforms, and the carriage of its head is at right angles to its neck, so it could lower its head and ram, absorbing the shock in its neck like a big-horned sheep."

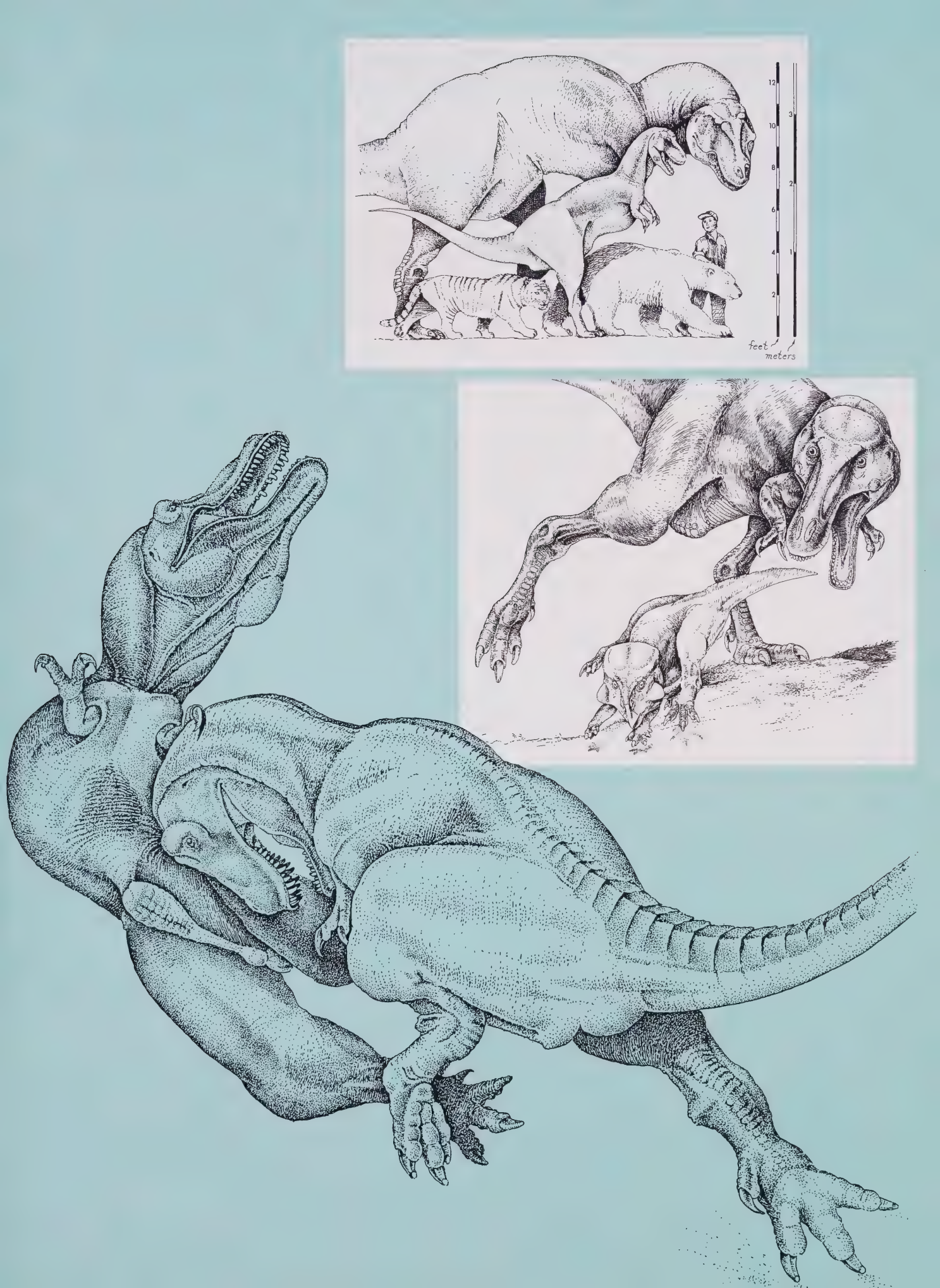
Head-butting "sounds possible" to Czerkas, "but I'd have to see the evidence." Bakker's critics, Czerkas at times among them, contend that his theories often go in advance of if not in opposition to facts. Though Bakker's contentions about warm-bloodedness in dinosaurs are not conclusive, his pioneering research has helped to give them a new image during the last decade, among scientists and the general public, as swift and nimble animals.

Nowhere is that new view of dinosaurs more evident than in Bakker's drawings—dinosaurs leaping, butting heads, or grasping at flying pterosaurs. There is nothing rushed about these drawings. Bakker is an inveterate doodler, dashing off accomplished sketches of dinosaurs, as well as other favourite subjects—rhinoceroses, elephants, toads, and Italian steamships—on napkins and scrap paper wherever his frenetic schedule takes him. But he does most of his serious drawing in a hoary ground-floor laboratory at the University of Colorado in Boulder where he is an adjunct curator of the Natural History Museum.

Bakker, like Czerkas, observes living animals for his illustrations. He has filmed rhinos charging him in Africa and has also studied his own pet crocodile, which he kept in a dormitory basement while an undergraduate at Yale. "You can't render extinct animals unless you study, film, and dissect live ones," he says. "Observing is better than taking measurements. The hand can touch the eye." Bakker devotes long hours to his drawing. "I spent four months writing my book, two years illustrating it." He draws sketches and final drafts with a .00 vacuum-fed rapidograph to produce a weighted line substantial enough that it "can survive sloppy American publishers that print it too dark or light."

In *Dinosaur Heresies* there is a two-page spread of *Tyrannosaurus rex* showing a smooth-headed, open-jawed tyrannosaur striding forward with its tail curled high above, and its hind leg raised. Its concave stomach indicates it's hungry as it eyes lunch—a charging *Triceratops*, head down and three legs airborne. Another *Triceratops*, reared up on hind legs, observes warily.

"Bob's drawings are dramatic, dynamic, and wrong," says Czerkas. "I think he overstates dinosaurs' mobility." Hallett concurs, quietly, finding Bakker's dinosaurs "too athletic for my tastes, and too fleshy." Bakker counters, "Stephen is the best sculptor of animals around, but he's so conservative I think his dinosaurs never get out of second gear."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Getting down to specifics, Czerkas contends that the tail of Bakker's *Tyrannosaurus rex* is unnaturally high, the gut too hollow. "They probably had bony gastralia right up to their giant pubis bone, so they couldn't look so hollow."

Bakker fires back, "Clearly they were very flexible animals. As for its stomach, lions, cheetahs, and wolves show the same sort of elasticity of the gut—it's empty, not sagging."

Czerkas finds fault along similar lines with Bakker's reconstructed *Tyrannosaurus rex* skeleton in Denver. "Being up on one foot, or jumping, would put so much strain on a huge body. It sounds painful to me," says Czerkas. Bakker counters, "Stephen's not a physiologist. Look at the strength of a *Tyrannosaurus rex* leg. If anything, big animals can do more." In posture, Bakker contends, the first *Tyrannosaurus rex* reconstruction was, like his own, a reasonable option. "*Tryannosaurus rex* was capable of a lot of motions, including standing up like they have it in New York."

If not standing up, as Bakker contends it might have done, *Tyrannosaurus rex* should be shown sitting down, Czerkas retorts. "That's what it was doing most of the time, sitting on its big pubis bone, just as lions and other predators lie around much of the day. But as far as I know only Eleanor Kish, a Canadian artist, has shown *Tyrannosaurus rex* sitting."

Czerkas's idea for a sitting *Tyrannosaurus rex* statue is just one example of the way in which each of these artists, only months after they've completed their best efforts at depicting *Tyrannosaurus rex*, say they would do it differently next time.

Hallett, siding with Czerkas against Bakker says, "I'd make the horns more prominent, maybe colourful—the males might have turned bright colours in sexual display. And I'd give it less teeth. They were always breaking off teeth when they bit things. I'd make it more snaggle-toothed."

Bakker says he'd pay closer attention to paws. "There's only one forepaw claw for a *Tyrannosaurus rex*, at Tyrrell, and its surprisingly blunt, not a meathook like it's often depicted."

Czerkas would make his *Tyrannosaurus rex* neck even straighter. "Most theropods (a group of meat-eating, two-legged dinosaurs to which tyrannosaurs belong) had S-like curved necks. *Tyrannosaurus rex* did not, but I've been guilty of elongating it and exaggerating the curve, as others have done."

Before these artists get their next chance, however, Bakker and other researchers may rewrite the rules for depicting *Tyrannosaurus rex*, thereby altering the conceptions that all artists and palaeontologists have of it. Bakker has spent much of the past year examining all museum specimens of tyrannosaurs, and with Philip Currie and Michael Williams, a palaeontologist at the Cleveland Museum of Natural History, is now in the process of reclassifying them in a new evolutionary order. One change already announced is that a specimen Bakker found in the Cleveland Museum basement represents a new genus of pygmy tyrannosaur, *Nanotyrannus lancensis*, a third the size of *Tyrannosaurus rex*.

Most upsetting of all to the *Tyrannosaurus rex* applecart is Bakker's as-yet-unpublished conclusion that the first of the three specimens of *Tyrannosaurus rex* found by the American Museum—the one from which the species was named—now at the Carnegie Museum in Pittsburgh—and the new-found Tyrrell specimen as well, do indeed represent a distinct, bigger-jawed ("more macho-looking" says Bakker) species of tyrannosaur than the creature we've come to know as *Tyrannosaurus rex*.

The dinosaur long on display in New York is, Bakker believes, a second, contemporary species of *Tyrannosaurus*, properly named *Tyrannosaurus imperiosis*. His view supports a notion put forward a decade ago by palaeontologist Dale A. Russell of the National Museum of Natural Sciences in Ottawa.

If Bakker and Russell are right, one thing is certain. Try as they might to reproduce the appearance of *Tyrannosaurus rex* during the seven decades since it was named, artists couldn't help getting it wrong, for what they were looking at so closely wasn't *Tyrannosaurus rex* after all.

Don Lessem is a Boston journalist and author who writes about dinosaurs and other natural history subjects for the Boston Globe, *Toronto* Globe and Mail, Smithsonian *magazine, and other publications. His latest book is* The Worst of Everything *(McGraw Hill).*

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DENDERA
Threads of Deception

The rediscovery of a 19th-century legal battle had disclosed the identity of an intriguing shawl

Monique Lévi-Strauss

IN May 1986 Brigitta Schmedding, curator of the Textile Department of the Royal Ontario Museum, wrote to me about a French shawl, dating from the mid-19th century, that the Museum had just acquired. Enclosed with her letter was a description of the textile and photographs. The shawl is square and is decorated with different buildings that extend from the borders of small rosettes towards a central star-shaped design. Among the architectural elements one can distinguish characters and animals evocative of the 19th century's vague notion of the fabulous Orient—China, India, and Egypt.

The choice of motifs reminded me of a long shawl known as the *Nou-Rouz* (Persian New Year), which had caused a sensation at the National Exhibition of Industrial Products in Paris in 1839. The *Nou-Rouz,* designed by Amédée Couder, was produced by Gaussen in Paris. An example of this famous shawl, from the collection of the Victoria and Albert Museum, was included in the exhibition of cashmere shawls at the Parisian *Musée de la Mode et du Costume* (Museum of Fashion and Dress) in 1982.

Since the borders, the central star-shaped design, and elephants that adorn the ROM shawl are like those in Couder's design, I assumed that the shawl dated after the *Nou-Rouz,* at earliest 1840. My research stopped there but, as it turned out, only temporarily, for I soon discovered that there was a complex story to this shawl.

In 1985 Wendy Hefford, a curator in the Victoria and Albert Museum's textile department, had informed me of that museum's purchase of a French shawl, known as *Jupiter,* which she knew had been the subject of a forgery charge. This information had been published in an 1844 fashion magazine. I decided to investigate this case further and after some searching through *La Gazette des Tribunaux* (The Law Reports) I found the exact date of the proceedings and the name of the plaintiff: it was the Parisian manufacturer Duché Senior, creator of the *Jupiter* shawl. He was accusing a manufacturer from Lyon, Damiron, of forgery.

The minutes of the proceedings of the Court of Commerce are kept in the Archives of Paris. As these documents are not catalogued, they could not be consulted directly; however, Brigitte Lainé the archivist in charge, after careful searching, was able to find the transcripts of the minutes of the proceedings. Several months later, I was contacted unexpectedly by Lainé who presented me with another dossier, from 1843, containing proceedings that concerned a second counterfeit charge involving a shawl.

This time the plaintiff was Frédéric Hébert, another Parisian manufacturer of shawls, who was also accusing Damiron of having copied the design of his shawl known as the *Dendera.* Hébert was also accusing two Parisian retailers, Chapusot and Tardiveau, of fraud. The cases of Duché Senior, and Hébert versus Damiron, Chapusot, and Tardiveau were tried at the same time. The discovery of the second case was not only an excellent piece of detective work on the part of the archivist; it would also shed more light on the history of the ROM's shawl.

Over the years I have spent hours and hours in the Archives of Paris recording the copyrights of shawl designs that were deposited in the *Conseil des Prud'hommes* between 1847 and 1870. I have noted the dates, the serial numbers, and the names that the shawl manufacturers gave to their works, which are often those of plants, celebrities, and places.

Hébert's *Dendera* shawl, which belongs to the last category, is named for a village in Upper Egypt situated on the left bank of the Nile, north of Thebes, and built on the ruins of the temple of the goddess Hathor. The temple, built in the 6th Dynasty, was entirely reconstructed in the time of the Ptolemies and finished under Tiberius. During the Egyptian campaign of 1798, General Desaix discovered at Dendera a sandstone sculpture representing a circular zodiac inscribed in a square with sides measuring about 2.5 metres. The whole circle was supported by the straining arms of a dozen figures. This zodiac decorated the ceiling of the sanctuary of Osiris, erected on the roof of the temple, and I discovered that its image would eventually become part of the

DRAWING BY LUISA LUPO KIRK

Facing page: This magnificent French shawl, recently acquired by the ROM, was part of a legal scandal in the 19th century. Gift of Mr. and Mrs. Thaddaeus Konopacki.
Above: Square shawls were worn folded on the diagonal in order to best display the principal motif.

decoration for the *Dendera* shawl as a result of the zodiac's being moved to Paris.

In 1821, a Frenchman successfully used an explosive to free the large sandstone holding the zodiac. (The stone broke into two pieces.) It was shipped to Paris, where it arrived six months later, and Louis XVIII acquired it for the enormous sum of 150 000 gold francs. The stone was first exhibited at the Louvre and then deposited in the royal library, now the Bibliothèque nationale, where it remained until 1919. It was then returned to the Louvre where it is sealed to the ceiling of the crypt of Osiris. An encyclopaedia notes that the zodiac of Dendera, which had been exhibited to the public since 1822, had excited the wildest imaginings among those who saw it.

Reading about Dendera and the description of the zodiac reminded me of the ROM shawl and so I compared photographs of it with engraved prints of the zodiac. There was no doubt. A large rosette inscribed in each quadrant of the shawl represented, in a stylized manner, the famous zodiac of Dendera, including the twelve figures—four standing females personifying the four principal points of the compass, and four pairs of kneeling guardian spirits with heads of sparrowhawks, their lifted arms criss-crossed.

The hieroglyphs on the centre of the sandstone are replaced on the shawl by a Hindu statue representing the god Brahma with four crowned heads. He is also endowed with four arms: one left hand carries the Vedas, the other a flask containing water from the Ganges, one right hand holds a purifying spoon, and the other a Buddhist rosary. This motif appears four times: twice in the same direction as the model and twice inverted. The Toronto shawl, which measures almost two metres on each side, is worn folded in two on the diagonal and placed symmetrically on the shoulders. This highlights the zodiac of Dendera, which gave the shawl its name.

What did Hébert wish to achieve when he conceived the *Dendera* shawl? Let us imagine him visiting the Exhibition of 1839. He discovers the *Nou-Rouz* and notes the success brought by this new type of decoration with human characters. Since the public is demanding the exotic, he will give it to them and will show them, in turn, that he is capable of producing a masterpiece. To make a piece comparable to Gaussen's *Nou-Rouz* on the theme of the Persian New Year, Hébert decides to reproduce the Dendera zodiac.

Hébert's office was located on rue du Mail, two steps from the royal library where, for sixteen years, the public had come to admire the famous zodiac of Dendera. Around the zodiac, Hébert chose to show some of the other marvels kept in this library. Irène Aghion, curator in the Cabinet de Medailles,

Details of the ROM's *Dendera* shawl showing the zodiac (left) and the elephant (right).

BILL ROBERTSON

MUSEE DU LOUVRE

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Left: Marie-Hélène Rutschowscaya, curator of Egyptian antiquities at the Louvre, found this photograph of the zodiac of Dendera, which is now installed in the ceiling of the crypt of Osiris, exhibited in the Louvre. *Right:* Irène Aghion of the Bibliothèque nationale, Paris, recognized the elephant motif of the *Dendera* shawl as reproducing one of the white elephant chess pieces from the famous *Treasure of Saint Denis*. The treasure had been on display at the library since 1840.

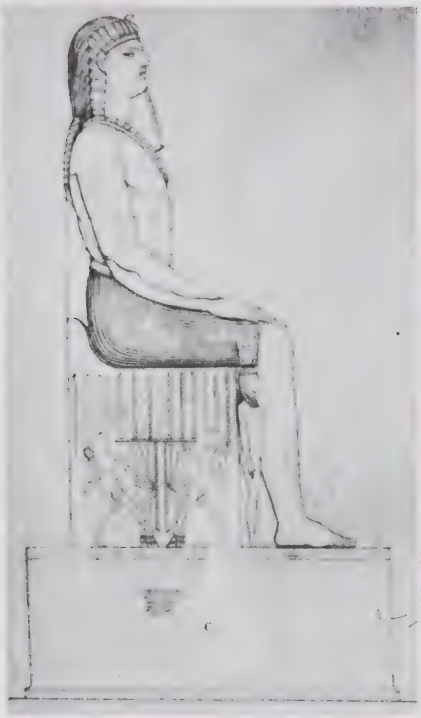
recognized the white elephants that border the large quarter-roundels positioned in the quadrants of the shawl as reproducing two pieces of a chess game (corresponding to our bishops) that were part of the *Treasure of Saint-Denis,* which had been on display since 1840. The elephants, each mounted by two elephant keepers, are made of ivory and have traces of gilt; they measure about twelve centimetres in height, date from the end of the 11th century, and were supposedly made in Salerno, in southern Italy. There are several similarities between the chess pieces and the shawl images: the elephant keepers' crooked sticks, the saddle blanket ruled in squares on the bias and framed by a pearl border, and finally the knee guards that protect the front of the elephants' feet.

Hébert also reproduced Egypt's colossus of Memnon after an engraving illustrating the book of Antoine-Jean Letronne, *La Statue vocale de Memnon,* which was published in Paris in 1833. The statue measures almost twenty metres high and stands on the plain of Thebes, near Luxor; it was partially destroyed by an earthquake in 27 B.C., then reconstructed by Septimus Severus in the 2nd century A.D. This accounts for the seams on the statue visible not only in the engraving but also in the shawl's image. Before being rebuilt, the damaged statue supposedly emitted harmonious sounds at sunrise, thereby giving birth to the legend that made it famous. The decoration of the shawl presents many other elements with meanings that remain a mystery, but the three motifs that have been identified show, without doubt, that Hébert wanted to create an exceptional piece.

In 1842, he brought the charges of counterfeiting against Damiron, Chapusot, and Tardiveau. There are minutes of several judgements pronounced between 1842 and 1844 against Damiron and company, a reflection of the many appeals that they made. The record of judgement of 14 June 1843 furnishes the following information:

"Whereas Hébert introduced to the market, starting in June 1841, a square cashmere French shawl, which he called the *Dendera* . . .

"Whereas Damiron Bros. offered for sale during the course of 1842 a square shawl made from *tissu Tibet* in which the design offers on several points the most striking resemblance to Hébert's shawl . . .



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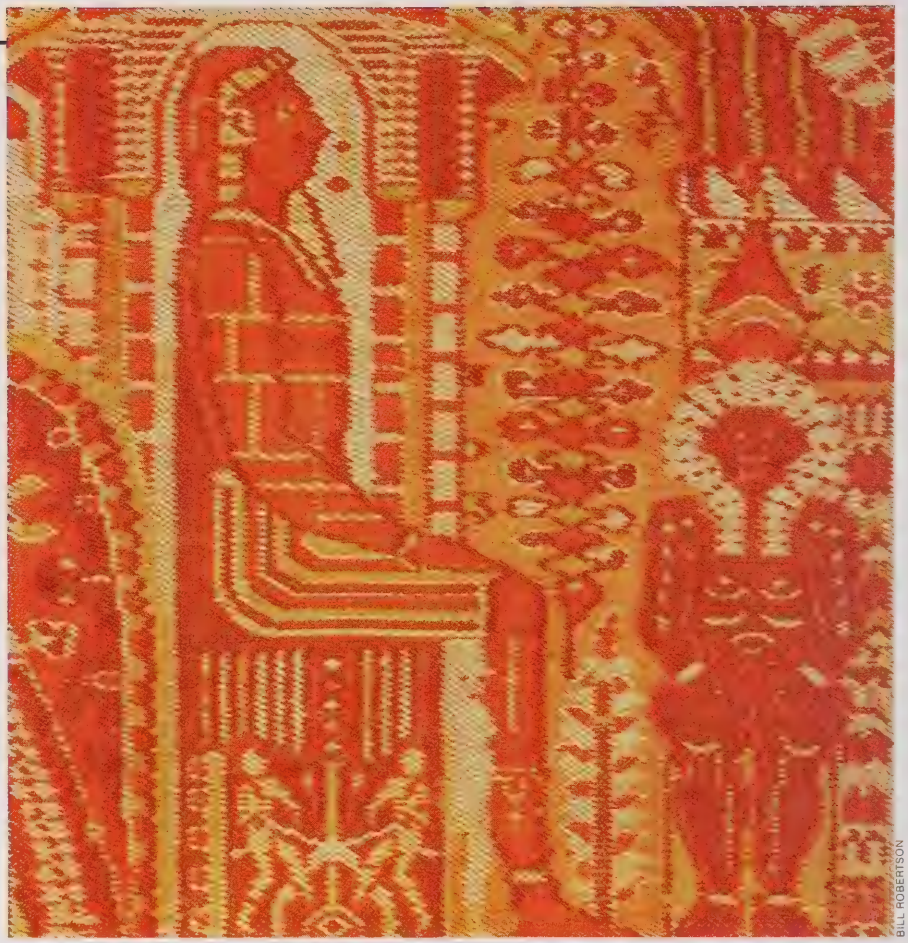

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Above: An engraving of the colossus of Memnon found in *La Statue Vocale de Memnon* by A.-J. Letronne, Paris, 1833. *Right:* A detail of the ROM's *Dendera* shawl showing the colossus of Memnon motif.

"Whereas the fine must be calculated on the extent of proven damage, that the Damiron shawl was manufactured with much cheaper material, in a simpler manner, in a smaller size, selling for a price close to three-quarters less than Hébert's shawl . . . that as a result there is for the manufacturer a fine which the tribunal can, at this time, determine to be a figure of 6000 francs.

"The tribunal having seen the arbitrator's report . . . condemns Damiron Bros. and Chapusot and Co., as jointly responsible, to pay to Hébert the sum of 3000 francs each by right of damages and interest, and to prohibit themselves in the future from ever selling directly or indirectly the shawl in question under the penalty of 100 francs for each shawl for which its sale contravenes that just stated . . . Damiron Bros. and Chapusot and Co. are ordered to pay costs in the amount of 105 francs for the amount laid out by the court for the acquisition of a counterfeit shawl."

From the minutes we know that Hébert's *Dendera* shawl dates from June 1841; that it was a French cashmere shawl (weft of cashmere wool and warp generally of cashmere wound around a core of silk); that Damiron's shawl was made of *tissu Tibet* (threads of waste-silk and wool or even cotton), a material often used by makers of shawls in Lyon; and that Damiron's shawl cost 105 francs, a price that was "three-quarters less" than that asked by Hébert for his shawl. Hébert's shawl must have sold for about 420 francs, which corresponds to the normal price for that time according to the report of the central jury of the 1839 exhibition. In the chapter about cashmere shawls and their imitations it is stated, "The square shawls, manufactured in Paris, in pure cashmere, measure from 180 to 195 cm per side. Their price varies from 220 to 500 francs and the number of colours used is rarely less than eight."

All that remains to be known is whether the ROM shawl was made by Hébert or Damiron. It is most likely Hébert for two reasons. First, there is the quality of the weave—forty-two warp threads per centimetre, and fifty-eight to sixty-five passes of weft thread per centimetre; and finally the dimensions of the shawl correspond to those normally used in Paris for a top quality shawl.

Monique Lévi-Strauss is an expert on French shawls. She lives in Paris, France.

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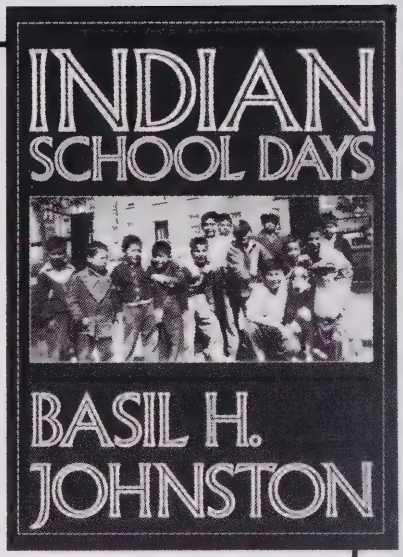

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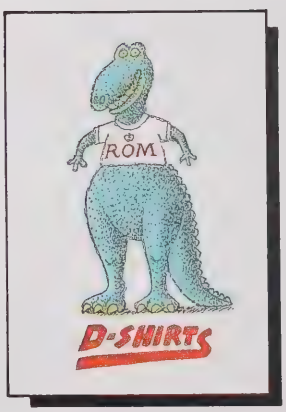

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A white marlin, *Tetrapturus alibudus*, recently donated to the ROM.

► The ROM is acquiring collections of specimens of Atlantic marine fishes and of local freshwater fishes, which are mainly for use in the preparation of models for the new Ichthyology gallery. Shipments from the Gulf of St. Lawrence and the Atlantic Ocean arrived from the Institut Maurice Lamontagne at Mont-Joli, Quebec, via Luci Bosse, and from the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, via Peter Koeller. Both organizations belong to the federal Department of Fisheries and Oceans. The specimens sent to us are sufficient in number to provide not only gallery exhibits, but very useful material for the reference/research collections as well. A 1.5-metre-long specimen of a very popular southern sportfish, the wahoo *(Acanthocybium solanderi)* is the first physical evidence of the occurrence of this species in Canadian waters. Southern species wander into the Canadian area, often as a result of the shifting position of the Gulf Stream.

A specimen of the white marlin *(Tetrapterus albidus)* a little more than two metres in length, is the first complete specimen of this large sportfish in our collection.

Local species of freshwater fishes were made available by the Fisheries Branch of the Ontario Ministry of Natural Resources. The specimens were collected through electrofishing activity, in which ROM staff took part, at Hamilton Harbour.

The ROM is indebted to these government agencies not only for their support over the years but for this special involvement in our gallery preparations.

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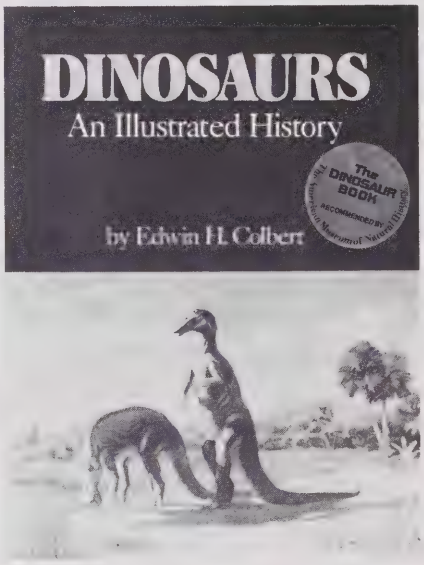
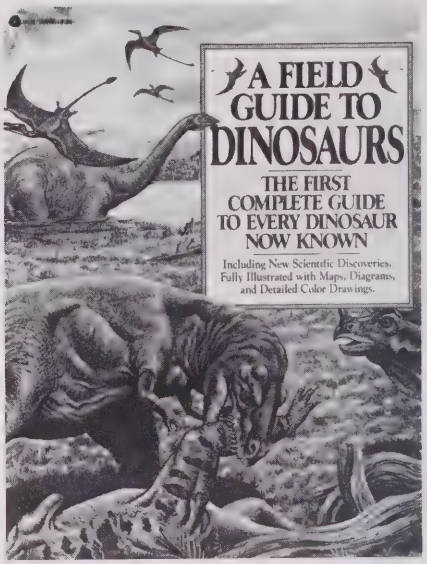


Dinosaurs: An Illustrated History
Edwin H. Colbert
Hammond Inc.,
224 pp. $30.00 (cloth)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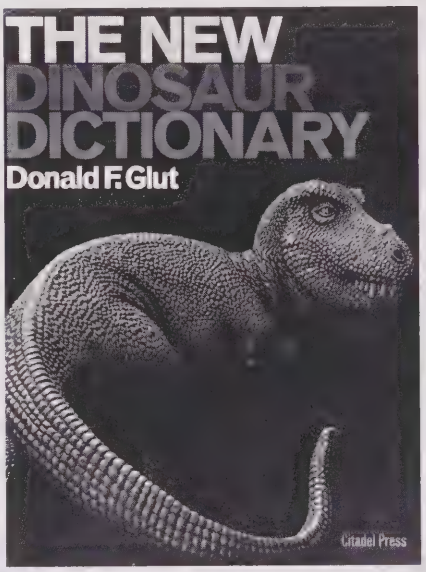
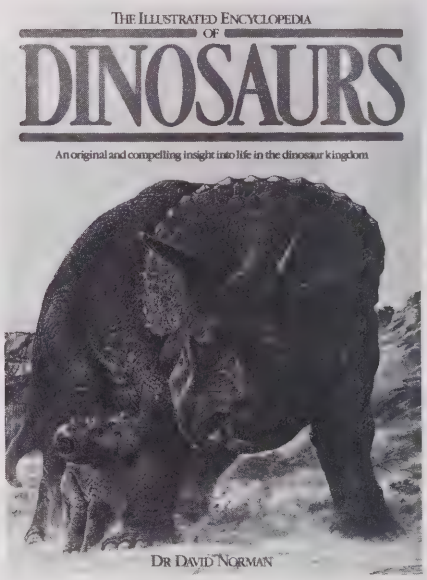


The New Dinosaur Dictionary
Donald F. Glut
Citadel Press
288 pp. $12.95 (cloth)


THE ILLUSTRATED ENCYCLOPEDIA OF
DINOSAURS
An original and compelling insight into life in the dinosaur kingdom
DR DAVID NORMAN

The Illustrated Encyclopedia of Dinosaurs
Dr. David Norman
Crescent Books
208 pp. $24.95 (cloth)

Reviewed by Kevin Seymour, curatorial assistant, Department of Vertebrate Palaeontology, ROM

The recent discovery of dinosaur eggs in Alberta has added more fuel to fire the seemingly endless public enthusiasm for all things dinosaurian. However, most books on dinosaurs do not include the most up-to-date findings or the interpretations that are derived from them. No matter how recently published,

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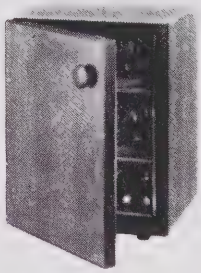

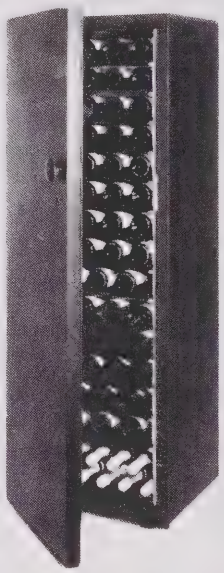

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many dinosaur books just repeat the same old "facts," many of which are now disputed or proven false. The four books reviewed in this article are exceptions. They are all up-to-date, accurate, clearly written, readable, entertaining, and each has its own particular strength. If you are looking for one book that offers a balanced account of the issues, read Edwin Colbert's *Dinosaurs: An Illustrated History.* If you have children who constantly bombard you with questions, find *A Field Guide to Dinosaurs.* And no dinosaur enthusiasts or students should be without David Norman's *The Illustrated Encyclopedia of Dinosaurs* or Donald Glut's *The New Dinosaur Dictionary.*

Edwin Colbert's forty years of studying extinct reptiles at the American Museum of Natural History in New York have made him a leading authority on the subject. However, this book is written for those who know very little about dinosaurs and who may be daunted by all the scientific terminology. Colbert carefully explains such things as the geological time scale, how dinosaurs are classified, and what their long names mean.

The lengthy introduction enchants the reader with the romance of the early days of dinosaur hunting. This is followed by chapters on what a dinosaur was, the first dinosaurs, and dinosaurs of the Jurassic and Cretaceous periods. There are many high-quality photographs and reconstructions, as well as the material that is the stuff of most dinosaur books. However, Colbert then goes on to discuss walking, running and leaping, the question of whether dinosaurs were warm-blooded, brains and behaviour, the life cycle, and the world in which dinosaurs lived. He ends with the most complete discussion of the extinction of dinosaurs that I know of. In short, he deals with most issues of interest beyond the beasts themselves and does it in a highly readable way.

If you have only a small amount to spend on *one* dinosaur book, *A Field Guide to Dinosaurs* is the book

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to buy. In fact, when I am asked specific questions about dinosaurs, such as the weight of *Diplodocus*, I invariably reach for this book (answer: only about 10.6 tonnes).

Two introductory chapters describe what dinosaurs were, how they lived, where they came from, and how they are classified. The last three chapters briefly describe life in each of the Mesozoic periods (Triassic, Jurassic, and Cretaceous), extinction, the fossilization process, excavations, various dinosaur-producing sites worldwide, and the locations of dinosaur displays. The main body of the text, however, is the middle chapter, divided into six sections, in which dinosaurs are identified by family group. Each group is concisely introduced with a family tree and a full-body drawing highlighting major anatomical features. There are maps showing where each genus in the family has been found and detailed descriptions of each genus, including estimated lengths, weights, and heights. For the purpose of comparison generalized silhouettes of each genus, drawn to scale, are placed side by side. Add to this a straightforward albeit minimal text and you have the most functional book on dinosaurs.

Norman's *Encyclopedia* is the best general dinosaur book on the market. Although it has been adapted as a university text in some places, it contains much that can be easily read and understood by almost anyone. After a broad introduction to the history of dinosaur discoveries, Norman includes a unique section entitled "To Study a Dinosaur." An expert on *Iguanodon*, he uses this dinosaur to explain how all dinosaurs are actually studied. Beginning with the discovery of fossils in a quarry, he describes the whole process leading up to the reconstruction of the skeleton, and answers such common questions as: Where are dinosaurs found? How are they excavated and preserved? Just what does studying a dinosaur entail? How are the bones reassembled? How are muscles reconstructed? How are conclusions

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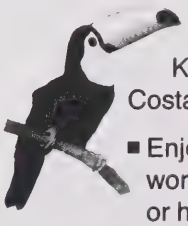

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drawn about parts not preserved? Norman distinguishes indisputable facts from conclusions based on reasonable deductions, thereby going a long way towards offering an explanation of how all scientific research is conducted.

Most of the remainder of the book presents detailed descriptions of all types of dinosaurs, grouped by family. Each family description includes remarkably clear and accurate black and white drawings of important individual parts (such as skulls and feet), as well as whole skeletons and an indication of known and unknown skeletal elements. This is a highly unusual and refreshing approach. There are numerous photos of actual museum specimens and many colourful and skilfully rendered reconstructions of representative species, as well as family trees, maps locating where specimens have been found, and silhouettes of each type scaled to height. There is even a substantial section on dinosaur contemporaries, including pterosaurs, crocodiles, lizards, snakes, and mammals. A comprehensive section on controversies, a summary of dinosaur-bearing deposits worldwide, a list of specific dinosaurs on display in major museums around the world, and a glossary round out this book. It is just so jam-packed with accurate and detailed information that even the most knowledgeable dinosaur enthusiast cannot fail to be overwhelmed.

Glut's *Dictionary* is an alphabetical listing of every valid genus of dinosaur (almost four hundred of them), even those described only by footprints or eggs. Glut also includes in the listing misspelled or invalid names, and directs the reader to the valid names. For each genus he gives the name of the person who first described it and date of the description, the order and family to which the genus belongs, the geological time period(s) in which it has been found, and a description of what material exists (shockingly little in most cases), followed by diverse comments of interest. This is just the sort of succinct information that one would expect from a dictionary and in this role the book is unsurpassed.

Besides a brief introduction to each family of dinosaurs, there are four addenda. The first is a compilation of dinosaur genera, which arrived too late for inclusion in the body of the text, and the second comprises two pages of last-minute additions. Although this effort to keep the book as up-to-date as possible is laudable, it is likely to be missed by most readers. The third addendum includes a list of new material in the preliminary stages of research, and the last addendum is a two-page listing of animals that have appeared in the palaeontological literature but which are no longer considered to be dinosaurs. There is also an index of illustrations. The many illustrations range from scientifically accurate drawings of single bones to fanciful reconstructions, and from some drawn a century ago to others done specifically for this book. This gives a very uneven but curiously interesting quality to the book.

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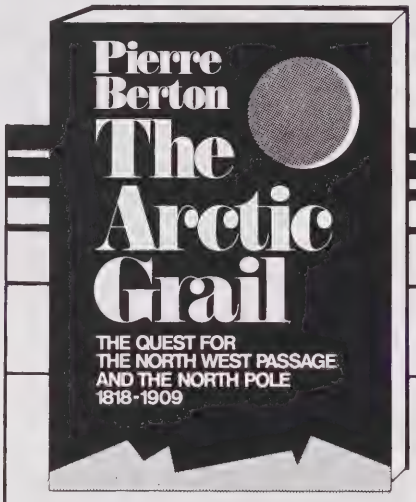

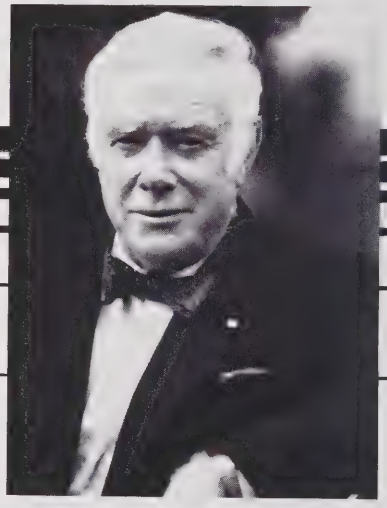

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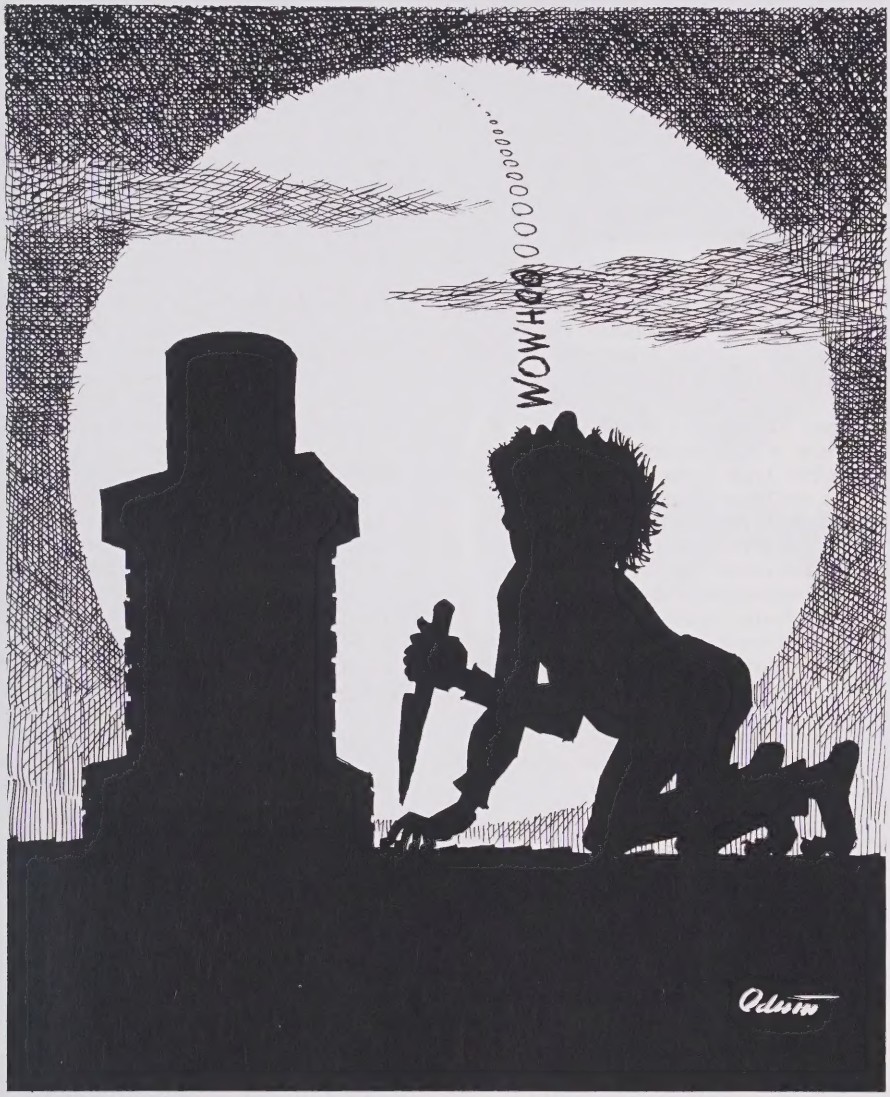

1. If you were standing on the surface of the moon, would you be able to see any man-made structures on Earth with the unaided eye?

2. Two British scientists have calculated the exact date of Christ's crucifixion to be 3 April A.D. 33. A reference to a "blood-red moon" in Acts 2:20 was critical in helping them to reach this conclusion. What's the significance of that moon?

3. Alan Shepard was one of many American astronauts to walk on the surface of the moon, but he was the only one to play a popular sport while he was there. What was it?

4. We have all seen how gigantic the moon looks when it's at the horizon. Why is that so?

5. The word lunacy, of course, refers to the commonly held belief that people behave strangely when the moon is full. Is this simply a folk belief or is there some empirical evidence of "lunacy"?

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ROTUNDA QUIZ

The Answers

1. Probably not. At the beginning of this century, William Geil claimed in his book *The Great Wall of China* that the Great Wall could be seen from the moon. But while the wall certainly has the length, it's not nearly wide enough to be seen from the moon without a telescope, and there is not much contrast between the wall and its earthen background. Furthermore the Earth is much brighter than the moon, and so faint objects on the Earth's surface would be washed out.

2. The reference to the blood-red moon (attributed to St. Peter some seven weeks after the Crucifixion) has been interpreted by these scientists as being the description of a lunar eclipse. It's true that during a lunar eclipse, even though the moon is in the Earth's shadow, it isn't rendered completely invisible. Light from the red end of the sun's spectrum is bent by the Earth's atmosphere into the shadow, and dimly illuminates the moon's surface. After using historical records to fix the Crucifixion to some time in either A.D. 33 or 34, the scientists then used computer reconstruction of the movements of the Earth, moon, and sun in those years to search for an alignment that would have produced an eclipse of the moon. There was one on 3 April 33. Of course, as is always the case when scientists dare to trespass in religious matters, they have been roundly criticized by some biblical scholars for taking the Acts 2:20 quotation too literally.

3. Golf. In February 1971, during the Apollo 14 mission, Shepard and fellow astronaut Ed Mitchell were returning to their lunar module when Shepard turned to the TV camera, held up a makeshift six-iron, and then produced a ball that he referred to as "a little white pellet that's familiar to millions of Americans." Shepard swung at this ball once, missed, and swung again, hitting it about 90 metres. He then dropped a second ball and hit this one—in his words—"miles and miles and miles." In a press conference back on Earth, Shepard estimated that the second ball had travelled 360 metres, an amazing distance under any conditions, but even more so considering a six-iron normally carries about 155 or 165 metres, and that he hit it one-handed because his space space suit was too bulky to allow a two-handed swing. Of course, the moon's one-sixth gravity accounts for the amazing distance. It's been calculated that golfers on the moon could drive the ball almost 2.5 kilometres and easily clear hills a half kilometre high. And it would be impossible to hook or slice a ball because there's no air to interact with the spinning ball thereby throwing it off course.

4. It is an illusion. A simple test illustrates that the image of the moon's disc is no bigger at the horizon. If you hold an aspirin at arm's length, you'll find that you can almost cover the moon wherever it is in the sky, overhead or at the horizon. Experiments have been done with mirrors as well, showing that the horizon moon, if seen overhead, looks no bigger than the overhead moon. The moon's image is the same wherever it is in the sky, so the bigger girth of the horizon moon must be a figment of our perception.

The generally accepted explanation for the moon illusion goes like this. When you look at the moon at the horizon, all the distance cues that are used by your mind suggest that the moon is very far away. Yet the image of this moon as it falls on the retina of your eye is the same size as when it's overhead, where there's nothing to indicate such great distance. This is an impossible situation: the same object cannot produce equal-sized images in your eye when the object is near and when it is far away. Your mind resolves the problem unconsciously by deciding that the horizon moon must actually be a larger object. Having made that assumption, the perceptual machinery of your brain makes the horizon moon *look* bigger.

5. Some people may behave strangely when the moon is full, and surveys have shown that half the population believes this to be true. But there is very little hard evidence to support this belief. One much-quoted 1972 study claimed to demonstrate an association between the full moon and homicides in Dade County, Florida. But a second look at the statistics of this study showed that an equal number of murders was likely at any phase of the moon. Another study suggesting that more traffic accidents occurred during the full moon fell apart when it became clear that the statistics were based on weekend and holiday traffic. New studies of suicide, hockey violence, and murder in Cleveland have failed to establish any connection to the full moon.

Why then do so many people believe that the full moon does prompt strange behaviour? Psychologists James Rotton and Ivan Kelly blame a number of fairly mundane psychological factors: we look for a simple cause when something unusual happens, we forget the nights when there was a full moon and nothing happened, and we may even look harder for unusual behaviour if we know there is a full moon. Besides, Ann Landers said it was true. One final note: you might be relieved to know that an article in the journal *Human Behavior*, in February 1982, was entitled "No Lunar Rhythms in Human Copulation."

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